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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

JANUARY 1951
Volume 2 No. 1

CONTENTS

SURFACE DATA

Page
General Summary of Weather Conditions 1
Condensed Climatological Data - States 2
Climatological Data - Stations 3
Heating Degree Days 8
Severe Storms 9
General Summary of River and Flood Conditions 13
Flood Stage Data 15

UPPER AIR DATA

Radiosonde Data 17
Pilot Balloon Data 20
Rawin Data 21

SOLAR RADIATION DATA

Solar Radiation Intensities 22
Blue Hill Data 22
Daily Totals and Average Daily Totals by Weeks 24

CHARTS I-XI

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 2 No. 1

JANUARY 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

January 1951 was a rather mild month. The average temperature for the country was 33.1°, with most station averages showing slight plus departures. Stations with minus departures, all small, included those in southern Florida, northern California, a belt along the Northern Border west of the Great Lakes including Iowa, and a narrow belt immediately east of the Continental Divide extending from eastern Montana to western Texas. This departure pattern was in sharp contrast to those for January 1949 and 1950 when minus departures in the West and plus departures in the East were near record levels.

Like the preceding month of December, January was somewhat drier than usual with a nationwide average total precipitation of 1.81 inches which is 0.44 of an inch below the long-term mean. The areal distribution was very uneven,but the total area with above-normal amounts about equaled the total area with deficiencies.

There were two principal areas of heavy precipitation. The first included most of Washington and Oregon and the northern half of California where monthly totals ranged up to nearly 30 inches and the percentage of normal generally ranged from 125 to 175. The second area extended from southwestern Pennsylvania and southern Ohio southwestward into Louisiana and extreme eastern Texas where monthly totals ranged up to more than 12 inches and the percentage of normal ranged from 150 to 250.

Areas with outstanding deficiencies included the Florida Peninsula, central, southern, and western Texas,much of the lower Great Basin of the far West, and a considerable portion of the northern Great Plains. Monthly totals in these areas generally were only a few hundredths,and less than 50 percent of normal.

There were few record-breaking extremes of either precipitation or temperature, although during the closing days of the month temperatures reached unusually high levels at a number of stations in the far Southwest and were unusually low in north-central areas and the northern Rocky Mountain Region. The country's extremes of temperature ranged from 94° at Indo, Calif. on the 26th to -56° at Bondurant, Wyo. on the 30th, and average temperatures for the month ranged from 68° at Key West, Fla. to -4° at Cooperstown, N. Dak. Monthly totals of precipitation ranged from zero at 59 stations in Texas, 11 in Florida, and 2 in California up to 29.58 inches at Valsetz, Oreg. Monthly totals of precipitation amounted to only a trace in one or more stations in Kansas, Montana, Nebraska, Nevada, New Mexico, Utah and Wyoming. The greatest 1-day measurements of precipitation exceeded 6 inches at a number of stations in Louisiana.

The first of two significant cold periods during the month began in the northern Great Plains and northern Rockies on the 4th with an advance of cold air that by the 9th overspread practically the entire country. Cold waves occurred in portions of the northern Plains on the 4th and in the lower Great Plains on the 7th. On the 6th Minnesota recorded -37°; and on the 7th Wisconsin recorded -37°; Iowa, -32°; Michigan, -17°; and Missouri, -2°. On the 8th below-freezing temperatures extended over all of Texas except the Brownsville area, and temperatures at stations along the Gulf Coast fell to 28° at Lake Charles, La., 30° at New Orleans, La., and 24° at Mobile, Ala. Florida recorded its lowest temperatures of the month on the 9th, with minima ranging from 20° in the north to 32° in the southern interior.

Following this cold period there was a general trend to warmer weather, and during the third week temperatures were seasonably high over the entire country. On the 18th maximum temperatures east of the Rockies ranged in the 80's in southern Texas, in the 70's throughout most of the Southern States, and 60° or higher was registered at stations as far north as Omaha, Nebr., Des Moines, Iowa, Columbus, Ohio, and Baltimore, Md. Temperatures were above normal in the Southwest throughout the last half of the month until the final days, and rose to near-record levels during the first part of the fourth week.

The second and most severe cold wave of the month occurred during the closing days, when cold air overspread the entire nation. This cold wave was first felt in the northwestern quarter of the country,as an advance of Arctic air into that region was marked by near-blizzard conditions in the northern Rockies and northern Plains that left many roads blocked by snow drifts. The arrival of the cold air in the central and lower Great Plains caused unusually large and rapid falls in temperatures; Goodland, Kans., reported a drop of 76° in 18 hours from 79° on the 26th to 3° on the 27th. By the 30th below-zero temperatures extended southward to central Nevada in the far western interior and to northern Texas in the central interior, and below-freezing minima extended southward over the Great Plains to Brownsville, Texas and along the West Coast to northern California. Lowest temperatures in a few of the northern States were: Montana, -55°; North Dakota, Iowa, and Michigan, -43°; Minnesota, -47°; Wyoming, -56°; and Wisconsin, -53°. By the end of the month only Florida and a few stations in the extreme Southwest had escaped the extreme cold.

Precipitation was fairly well distributed through the month. During the first week light precipitation was frequent in the northern interior and moderate to heavy rains fell in the Mississippi and Ohio Valleys at the beginning and end. Heavy precipitation fell in the Northwest at the beginning of the week,and strong winds caused some damage in Washington when a deep Pacific LOW moved over the State.

The extreme Northwest received light to moderate precipitation during most of the second week, and on the 11th and 12th a storm brought light to moderate precipitation to California and mostly light amounts to southern interior regions west of the Continental Divide. In central coastal districts of California thundersqualls and several tornadoes caused considerable property damage. From the 13th to the 16th a LOW that developed over the lower Mississippi Valley and moved northeastward resulted in precipitation that was mostly light in the Great Plains, heavy over the Ohio and south-central Mississippi Valleys, light to moderate in the Southeast, and moderate to heavy in New York and New England.

Except for heavy precipitation along the north Pacific Coast and in the Cascade and Sierra Nevada Mountains, northern Utah and Nevada, the third week was very dry. In the southern Great Plains and Southwest mild temperatures and strong winds further reduced the already low moisture supplies in those areas.

Light to moderate precipitation occurred east of the Mississippi, with some heavy amounts in the Northeast during the passage of a LOW across the northern Great Plains and Lake Region on the 23d and 24th. On the 25th a Pacific LOW attended by high winds and heavy precipitation moved inland over Washington. Precipitation caused by this storm was limited to Washington and a few surrounding areas, since the storm was prevented from moving far inland by high pressure over the northern Rockies.

Snowfall generally was above normal in the far West, and in a belt extending from the lower Lake Region southwestward to eastern Texas, but below in most of the Great Plains area, and from the Appalachians to the Atlantic Coast. In the lower Ohio and central Mississippi Valleys, eastern Arkansas, northern Louisiana, and eastern Texas monthly totals were more than 200 percent of normal. In most areas east of the Rocky Mountains the heaviest snowfall occurred during the last part of the first decade and during the closing days of the month. The ground was bare most of the month in the Great Plains as far north as South Dakota and in the Ohio Valley after the first week. By the end of the second decade snowcover in the Northeast was limited to central and northern portions of New York and New England. In Wisconsin, northern Michigan, northeastern Iowa, and eastern Minnesota, however, temperatures were persistently low enough to prevent much melting, and depths that ranged from 10 to over 20 inches at the beginning of the month ranged from 15 to 20 inches in northeastern Iowa and southern Wisconsin up to more than 40 inches in Upper Michigan at the end.

Tornadoes caused $1,500,000 damage in central California on the 11th, and another that occurred near Alexandria, La. on the 6th caused $175,000 damage. This is about five times as much damage as these storms usually cause in January. By far the most damaging meteorological element, however, was the severe icestorm (glaze) that began during the closing days of January and continued until February 1. Glaze covered a large area from Texas to New England, but was most severe in Tennessee and some surrounding areas and in Louisiana and Mississippi where damage was great. In Tennessee and surrounding areas the Bell Telephone Company alone estimated its losses from five to six million dollars. Much greater losses occurred in Mississippi and Louisiana, a report of which will appear in the February issue of this publication.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

JANUARY 1951

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	47.9	+1.0	4 Stations	78	†13	Alexander City 6NE	13	9	4.07	-0.78	Waterloo	12.47	Clayton	1.10
Arizona	41.9	+1.4	5 Stations	86	†25	Maverick	-17	13	1.32	+0.33	Sierra Ancha	4.86	Klagetoh	0.11
Arkansas	41.5	+0.3	2 Stations	80	†18	White Rock	-2	31	5.43	+0.99	Marvell	12.96	Harrison	E1.08
California	44.4	+0.2	Indo U.S. Date Garden	94	26	Boca	-12	20	4.04	+0.06	Gasquet R.S.	21.70	2 Stations	0.00
Colorado	23.6	+0.3	2 Stations	80	26	Taylor Park	-35	7	1.10	+0.17	Wolf Creek Pass 4W	6.79	do	0.05
Connecticut	30.7	+3.7	Greenwich Waterbury	61	19	Putnam	-8	9	3.61	-0.14	Moodus Res.	5.16	Stafford Springs	2.43
Delaware	37.5	+2.5	Lewes	71	19	Lewes	10	9	2.43	-1.12	Wilmington Porter Res.	3.75	Bridgeville	1.30
Florida	59.3	+0.1	Titusville 2W	86	30	Secotan	20	9	0.93	-1.80	Saint Marks	3.89	11 Stations	0.00
Georgia	48.8	+0.6	2 Stations	80	†20	Blairsville Exp. Sta.	9	9	1.72	-2.38	Noontootla Creek	4.21	Jesup	0.62
Idaho	23.4	-0.1	Grand View	62	15	2 Stations	-42	29	2.13	+0.12	Burke 2ENE	8.10	Chilly Barton Flat	0.15
Illinois	23.4	+0.7	2 Stations	70	†18	Freeport	-29	30	2.34	+0.01	Brookport Dam 52	8.30	Carlinville 4E	0.66
Indiana	30.4	+1.7	6 Stations	69	†18	Hobart	-14	30	3.36	+0.36	Jeffersonville	8.02	Hobart	E0.72
Iowa	17.9	-1.8	2 Stations	68	18	Decorah	-43	30	0.63	-0.38	Lansing	1.74	Inwood 2W	0.02
Kansas	30.1	-0.2	Ashland	83	26	Goodland WB Airport	-19	31	0.76	+0.10	Fort Scott	1.79	Medicine Lodge	T
Kentucky	37.8	+1.8	Mammoth Cave Park	76	20	2 Stations	-2	8	7.54	+2.98	Herndon	11.66	Ashcamp	2.54
Louisiana	52.2	+1.1	Covington	82	20	do	15	31	6.76	+1.87	Riverton Dam	11.70	Burrwood	1.72
Maine	21.1	+4.0	Bar Harbor	55	4	Lac Frontiere	-47	31	3.02	-0.33	Machias	5.06	Eustis	1.50
Maryland	35.4		Western Port	76	20	Hancock Fruit Lab.	-1	9	2.41		Sines Deep Creek	6.25	2 Stations	1.23
Massachusetts	30.8	+4.3	Chestnut Hill	63	20	Birch Hill Dam	-12	9	3.22	-0.45	Fall River	4.31	Springfield	2.07
Michigan	20.8	+0.7	Monroe Water Works	58	20	Kenton U.S. Forest	-46	30	1.94	+0.14	Bad Axe 5NW	4.88	Channing Sawyer Lake	0.31
Minnesota	5.3	-3.5	Winona	46	18	Itasca State Park	-47	29	0.53	-0.21	2 Stations	1.17	Tyler	0.10
Mississippi	48.5	+1.1	4 Stations	79	†14	Holly Springs	11	31	7.08	+1.80	Tupelo WB Airway	12.20	Biloxi Display	1.83
Missouri	32.6	+1.8	Waynesville	79	19	Unionville	-12	29	2.28	-0.03	Caruthersville	7.18	Oregon	0.43
Montana	14.6	-4.2	Big Timber	60	25	West Yellowstone	-55	29	0.77	+0.01	Summit	5.51	4 Stations	T
Nebraska	23.8	+0.7	Broken Bow	76	†18	Fort Robinson	-28	29	0.32	-0.23	Wahoo	0.96	3 Stations	T
Nevada	31.9	+1.2	Pahrump 2N	78	26	Jarbidge	-18	30	0.86	-0.20	Jarbidge	3.14	Dyer	T
New Hampshire	23.1	+3.9	2 Stations	60	† 4	First Conn. Lake	-29	31	2.39	-0.60	Manchester	3.78	Lancaster	1.37
New Jersey	34.6	+3.1	do	69	20	2 Stations	5	† 9	3.30	-0.31	Phillipsburg	5.28	Rutherford	1.34
New Mexico	34.3	+0.4	do	79	27	Levy	-26	31	0.61	+0.03	Eicks Ranch	2.44	6 Stations	T
New York	25.9	+2.7	3 Stations	64	19	Lawrenceville	-25	31	2.73	-0.17	Lake Ronkonkoma	6.48	Bolivar	1.07
North Carolina	42.8	+1.0	4 Stations	77	†20	Mount Mitchell	-3	8	1.54	-2.18	Clingman's Dome	5.61	Whiteville	0.37
North Dakota	3.3	-3.6	2 Stations	50	17	3 Stations	-43	29	0.57	+0.09	Turtle Lake	1.53	Golva 1SE	0.11
Ohio	31.3	+2.2	Ironton	72	20	2 Stations	-8	9	4.12	+1.18	Peebles	8.93	Defiance	1.30
Oklahoma	39.1	+1.1	2 Stations	83	†20	3 Stations	-5	†29	1.37	-0.18	Kiamichi Tower	5.08	Frederick	0.08
Oregon	31.8	+0.1	Seaside	66	6	Austin 3S	-38	29	5.78	+1.90	Valsetz	29.58	2 Stations	0.54
Pennsylvania	30.9	+2.4	5 Stations	71	†20	Jamestown	-7	22	3.74	+0.56	Albion	8.95	Milan	1.53
Rhode Island	33.6	+4.0	Providence WB City	64	19	Greenville	0	31	4.09	+0.12	Providence WB City	4.63	Greenville	3.56
South Carolina	45.9	-0.3	Yemassee	85	30	3 Stations	11	† 9	1.35	-2.10	Cleveland	2.78	Georgetown	0.35
South Dakota	15.6	-1.5	Armour	61	16	Britton 2N	-39	29	0.18	-0.37	Victor 5NE	0.74	Dixon	0.00
Tennessee	40.7	+1.4	Loudon	77	20	Crossville Exp. Sta.	1	9	7.70	+2.65	Savannah	12.68	Wolf Creek	1.81
Texas	46.9	+0.2	Rockport	90	19	Dalhart CAA AP	-12	31	1.02	-0.53	Jasper	9.07	59 Stations	0.00
Utah	26.2	+1.4	Zion N.P.	70	25	Woodruff	-31	31	1.09	-0.08	Alta	8.93	3 Stations	T
Vermont	21.0	+3.2	Dorset 1S	59	4	Lemington	-23	31	2.23	-0.54	Somerset	4.61	McIndoe Falls	1.36
Virginia	38.8	+2.0	Buggs Island Dam	77	4	4 Stations	3	† 8	1.77	-1.49	Big Meadows	5.45	Glen Lyn	0.34
Washington	31.0	+0.2	Everett	64	26	Winthrop 1WSW	-26	29	5.93	+1.56	Petersons Ranch	25.66	Wilbur	0.57
West Virginia	35.3	+2.3	Wardensville RM Farm	79	5	2 Stations	-6	9	3.79	+0.16	Fink Run	6.72	Princeton	0.62
Wisconsin	11.9	-2.4	Baraboo	48	17	Lone Rock CAA AP	-53	30	0.85	-0.39	West Bend	2.45	Winter Park Res.	0.18
Wyoming	17.8	-1.2	Torrington Exp. Farm	64	26	Bondurant	-56	30	0.87	-0.01	Kendall 3S	5.81	4 Stations	T

† Other dates also.

CLIMATOLOGICAL DATA

Table 2

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min. 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	998.3	1021.5	58	36	46.8	+3.9	72	20	20	†8	0	15	37	73	3.68	-1.84	0.86	12	1	T	T	8.7	S	34	SE	3	9	4	18	6.4	46
Mobile CO	10	------	------	63	43	53.3	+1.8	72	6	25	8	0	4	--	--	1.89	-2.96	.85	9	1	0.0	0	----	---	43	SE	28	--	--	--	5.7	48
Mobile	211	1013.5	1021.8	65	42	53.2	----	76	20	24	8	0	6	46	79	2.59	-----	1.17	13	2	.0	0	12.2	SSE	--	---	--	8	12	11	5.9	--
Montgomery CO	201	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1014.2	1021.7	62	38	49.9	+1.7	76	20	21	9	0	10	40	73	3.54	-1.66	1.09	11	0	.0	0	8.1	S	38	S	14	12	7	12	5.6	59
ARIZONA																																
Flagstaff	6993	785.6	1020.4	43	14	28.7	----	58	26	-6	13	0	31	17	64	1.61	-----	1.10	4	0	17.9	12	7.2	SW	--	---	--	9	4	18	6.4	--
Payson CO	4999	848.3	1018.6	53	27	40.0	----	73	25	16	31	0	25	23	57	2.81	-----	1.95	6	0	12.0	5	4.2	S	--	---	--	13	6	12	5.1	--
Phoenix CO	1083	------	------	66	40	52.9	+1.7	83	25	29	2	0	3	--	--	1.56	+.76	1.43	4	0	.0	0	5.8	---	28	W	12	--	--	--	--	88
Phoenix	1108	977.7	1017.2	67	37	51.9	----	85	25	25	2	0	10	30	49	1.58	+.78	1.31	4	0	T	T	4.2	E	--	---	--	15	8	8	[illegible]	--
Prescott	5014	848.3	1018.8	52	23	37.4	----	69	26	10	7	0	28	19	54	1.47	-----	.75	4	0	6.5	2	6.9	S	33	SW	10	12	9	10	4.8	70
Tucson	2558	927.5	1017.1	64	37	50.3	+1.2	82	26	28	2	0	7	29	50	1.12	+.22	.69	3	0	2.8	2	6.8	SE	34	W	12	17	4	10	4.2	83
Winslow	4880	852.0	1018.5	51	21	35.9	+3.8	64	26	7	7	0	28	18	53	.45	-.23	.35	3	0	1.0	1	8.8	SW	*56	SW	19	10	6	15	5.8	--
Yuma	203	1012.5	1017.7	71	42	56.3	----	86	25	31	2	0	2	31	43	.39	-----	.20	3	0	.0	0	7.7	NNE	33	W	30	21	7	3	2.6	94
ARKANSAS																																
Fort Smith	458	1002.4	1019.6	52	28	39.7	+.2	76	19	9	31	0	21	27	67	3.81	+1.27	2.08	8	2	2.4	2	9.5	NE	28	SW	20	--	--	--	6.5	50
Little Rock	257	1006.8	1019.9	54	33	43.2	+1.8	76	19	12	31	0	17	33	73	4.32	-.41	1.67	10	3	3.3	3	8.3	S	33	SW	17	--	--	--	6.3	50
Texarkana	361	1000.7	1019.7	56	34	45.3	-.2	77	19	13	31	0	13	34	72	4.47	-.34	1.21	11	5	4.3	3	11.6	S	--	---	--	10	6	15	6.0	--
CALIFORNIA																																
Bakersfield	489	1003.4	1021.7	57	39	48.0	+.5	70	22	28	2	0	5	40	77	1.61	+.51	.58	10	1	T	0	3.6	NW	--	---	--	2	8	21	7.9	--
Beaumont CO	2589	927.5	1018.9	58	36	46.9	----	76	25	24	1	0	10	30	53	1.95	-----	.81	8	1	.0	0	8.4	E	*28	E	6	13	7	11	5.0	--
Bishop	4108	875.0	1018.0	55	23	39.1	----	73	24	16	8	0	31	--	--	.25	-----	.21	2	0	2.9	3	----	---	--	---	--	8	10	13	6.4	--
Blue Canyon	5280	838.8	1019.3	41	29	34.9	----	64	24	15	30	0	22	24	69	15.17	-----	3.92	14	1	63.4	34	12.1	SSE	--	---	--	4	3	24	8.2	--
Burbank	699	992.2	1018.7	64	42	53.2	----	85	24	33	2	0	0	39	63	2.79	-----	1.02	8	0	.0	0	5.0	NW	*33	NNW	1	14	5	12	4.9	--
Eureka CO	43	1017.6	1020.0	53	41	46.9	.0	62	14	28	30	0	1	--	--	8.47	+1.36	1.43	18	2	T	T	7.3	--	32	SW	†15	5	1	25	8.5	21
Fresno	331	1009.5	1021.7	54	37	45.6	+.1	63	15	28	1	0	6	42	88	1.94	+.21	.79	7	1	.0	0	5.9	SE	27	SE	18	1	6	24	8.8	48
Los Angeles CO	312	------	------	64	47	55.7	+1.1	86	25	40	12	0	0	--	--	2.80	-.30	1.00	7	0	.0	0	6.8	---	35	E	10	13	10	8	4.8	71
Los Angeles	99	1015.2	1019.0	63	45	54.1	----	86	25	38	13	0	0	44	71	2.82	-----	.99	7	0	.0	0	5.3	W	--	---	--	13	7	11	4.9	--
Mt. Shasta CO	3543	893.0	1019.9	40	25	32.1	-1.3	59	25	9	30	0	28	27	78	5.64	-.67	1.65	14	0	46.6	26	8.4	SE	--	---	--	3	5	23	8.3	--
Oakland	3	1021.0	1021.2	56	41	48.3	+1.1	63	22	31	31	0	1	41	76	4.34	+.76	1.17	14	0	.0	0	4.7	SE	--	---	--	4	1	26	8.0	--
Red Bluff	341	1007.5	1020.5	50	38	43.9	-1.9	60	1	27	31	0	3	37	81	5.10	+.34	2.09	15	0	.7	1	8.5	SSE	42	SE	16	3	4	24	8.4	31
Sacramento CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Sacramento	17	1018.6	1021.0	52	39	45.3	-.5	59	4	27	31	0	4	41	86	1.97	-1.75	.49	11	1	T	0	10.4	SSE	49	S	11	3	1	27	8.6	27
Sandberg CO	4517	863.9	1019.2	48	33	40.8	----	67	26	22	1	0	15	26	63	.64	-----	.20	7	0	4.7	2	19.7	NNW	--	---	--	9	9	13	5.4	--
San Diego	19	1015.9	1019.1	65	47	55.7	+1.7	82	24	39	1	0	0	45	71	1.60	-.46	.73	8	0	.0	0	5.1	W	34	SW	11	19	5	7	3.9	75
San Francisco CO	52	------	------	55	46	50.3	+.4	63	22	40	30	0	0	--	--	4.41	-.13	1.06	14	0	.0	0	6.9	---	32	SW	11	5	7	19	7.2	46
San Francisco	1	1020.3	1020.9	55	43	48.7	+1.6	61	22	32	31	0	1	43	82	2.98	-1.08	.82	14	0	T	0	8.7	W	47	SW	[illegible]	3	5	23	7.9	--
Santa Catalina	1568	961.4	1018.4	59	47	53.0	----	80	25	40	30	0	0	--	--	1.61	-----	.41	8	0	.0	0	----	---	--	---	--	14	8	9	5.0	--
Santa Maria	231	1011.9	1020.4	62	39	50.9	----	82	25	28	1	0	2	42	76	1.97	-----	.59	9	0	.0	0	7.4	E	*30	NNE	23	12	6	13	5.6	--
COLORADO																																
Alamosa	7534	768.0	1020.7	40	3	21.2	----	58	22	-19	31	0	30	--	--	.03	-----	.03	1	0	1.7	1	----	---	--	---	--	10	12	9	5.2	--
Colorado Springs	6175	807.7	1019.7	39	13	25.7	----	66	26	-26	31	0	29	8	52	.59	-----	.26	8	0	7.7	4	11.8	NNW	--	---	--	10	12	9	5.5	--
Denver	5221	834.1	1018.0	39	15	26.9	-.4	68	26	-24	31	0	28	6	48	.83	+.25	.42	9	0	15.7	7	9.3	S	41	NW	3	7	9	15	6.3	68
Grand Junction	4849	860.1	1021.8	36	15	25.3	+1.3	55	28	-7	31	0	31	16	66	.78	+.18	.55	5	0	10.1	7	5.4	ESE	38	NW	19	8	5	18	6.9	49
Pueblo	4799	855.1	1018.6	43	13	28.2	-.5	74	26	-22	31	0	30	10	53	.54	+.23	.24	10	0	10.1	3	8.0	W	45	NW	22	10	10	11	5.7	58
CONNECTICUT																																
Bridgeport	7	1018.3	1019.1	41	26	33.0	----	56	19	8	31	0	26	25	74	3.10	-----	.97	13	1	4.5	2	10.5	NW	*35	NW	21	10	2	19	6.5	--
Hartford	15	1012.5	1018.5	40	22	31.0	+5.5	60	20	5	31	0	28	24	75	4.09	+.15	1.04	12	1	12.3	5	8.8	N	34	NW	21	7	4	20	7.5	47
New Haven	6	1015.9	1018.6	40	24	32.2	+4.8	57	20	7	31	0	27	--	--	4.00	+.33	1.03	12	1	6.7	4	7.5	---	25	SW	15	9	3	19	6.7	52
DELAWARE																																
Wilmington	73	1016.3	1019.5	44	24	34.2	----	66	20	14	9	0	27	25	70	3.64	-----	1.16	12	0	2.6	2	8.5	WNW	--	---	--	5	9	17	7.1	--
FLORIDA																																
Apalachicola	13	1020.7	1022.0	62	47	54.5	+.8	69	31	28	8	0	2	--	--	2.43	-1.22	1.09	6	0	.0	0	9.5	---	22	NW	7	14	11	6	3.8	79
Daytona Beach	33	1021.0	1022.4	70	46	58.0	-.5	79	†4	30	†9	0	3	49	80	.77	-1.49	.70	2	1	.0	0	9.5	NW	*24	NNW	22	13	14	4	4.3	--
Fort Myers	15	1021.3	1021.7	75	49	61.8	-2.1	83	31	33	9	0	0	51	76	.38	-1.38	.22	3	0	.0	0	7.0	E	--	---	--	19	10	2	3.1	--
Jacksonville CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Jacksonville	18	1021.7	1022.7	68	44	55.8	+2.2	79	20	26	9	0	5	45	74	.53	-2.27	.22	6	0	.0	0	5.7	S	32	N	22	13	9	9	5.0	71
Key West CO	5	1020.0	1020.7	75	62	68.3	-1.2	81	4	47	9	0	0	--	--	1.07	-.89	.64	7	0	.0	0	8.0	---	27	NW	9	16	9	6	4.1	64
Key West	6	1020.3	1020.6	73	62	67.5	-1.2	80	4	49	9	0	0	59	78	.36	-1.60	.13	6	0	.0	0	12.3	NE	--	---	--	18	12	1	3.1	--
Lakeland	----	------	------	71	51	61.1	-1.9	80	4	32	9	0	1	--	--	.27	-2.31	.12	3	0	.0	0	----	---	--	---	--	14	17	0	3.7	--
Melbourne	22	1021.0	1022.0	71	50	60.6	-.5	81	4	34	9	0	0	52	79	.24	-2.14	.17	3	0	.0	0	7.7	NW	*21	N	8	11	16	4	4.5	--
Miami CO	180	------	------	72	59	65.7	-2.2	77	5	36	9	0	0	--	--	.24	-2.03	.18	4	0	.0	0	----	---	33	N	25	14	15	2	3.6	69
Miami	9	1020.0	1021.0	75	56	65.2	----	80	30	36	9	0	0	54	70	.04	-----	.03	2	0	.0	0	8.2	ESE	*28	N	16	18	11	2	3.4	--
Miami Beach	----	------	------	73	62	67.2	----	78	15	39	9	0	0	--	--	.10	-----	.04	4	0	.0	0	----	---	--	---	--	17	10	4	---	--
Orlando	111	1018.0	1022.4	72	48	60.0	-.8	81	30	30	9	0	2	50	75	.52	-1.93	.40	2	0	.0	0	6.5	E	*24	NW	8	12	14	5	4.3	--
Pensacola CO	13	1019.3	------	64	47	55.3	+2.8	71	19	25	8	0	3	--	--	1.99	-2.00	.57	11	1	.0	0	----	---	24	W	7	11	8	12	5.4	69
Pensacola	118	1017.3	1021.6	65	45	55.0	----	73	†14	25	8	0	4	47	--	3.00	-----	1.33	10	0	.0	0	[illegible]	[illegible]	--	---	--	--	--	--	---	--
Tallahassee	64	1020.0	1022.4	66	41	53.2	+1.5	76	†20	26	9	0	6	42	74	1.96	-2.54	1.16	6	0	.0	0	6.6	SE	--	---	--	15	8	8	4.3	--
Tampa	24	1021.0	1022.2	72	50	61.3	+.9	81	31	33	9	0	0	50	72	.54	-2.15	.28	3	0	.0	0	6.8	E	28	S	14	16	14	1	3.4	83
West Palm Beach	14	1020.3	1021.0	75	56	65.3	----	81	21	38	9	0	0	55	74	.33	-2.74	.18	7	0	.0	0	7.9	NW	--	---	--	11	14	6	4.8	--
GEORGIA																																
Albany	190	1015.6	1027.8	65	39	51.9	-.1	78	31	24	9	0	9	40	69	1.22	-2.93	.47	7	0	.0	0	5.5	SSE	*42	WSW	14	14	10	7	4.1	--
Atlanta CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Atlanta	977	979.0	1021.9	55	36	45.3	+2.8	70	20	21	26	0	11	34	68	2.25	-2.78	.78	12	0	.0	0	10.5	NW	*33	NW	7	10	6	15	5.8	58
Athens	798	992.2	------	54	34	43.8	----	70	20	19	†9	0	13	--	--	2.65	-----	.94	13	0	.0	0	----	---	--	---	--	11	6	14	5.5	--
Augusta	426	1015.9	1022.4	60	34	46.7	-.3	76	20	19	†10	0	13	35	72	1.14	-2.71	.46	9	0	.0	0	6.3	SE	*25	WNW	15	12	4	15	5.5	--
Columbus	382	1007.8	1022.3	61	36	48.8	----	72	20	19	9	0	13	38	73	2.06	-----	.88	10	0	.0	0	8.6	S	--	---	--	11	10	10	5.3	--
Macon	354	1008.5	1019.9	62	37	49.6	----	76	20	24	†9	0	11	37	68	1.31	-----	.52	7	0	.0	0	9.5	NW	36	S	14	12	10	9	5.2	66
Rome	637	998.3	1022.2	54	30	42.3	----	69	†3	14	9	0	19	33	75	4.09	-----	1.07	16	2	T	0	8.7	N	--	---	--	8	11	12	6.0	--
Savannah	38	1020.3	1022.7	63	39	50.6	+.8	77	20	23	9	0	8	40	74	.85	-1.93	.31	6	0	.0	0	9.5	WNW	27	NW	7	11	11	9	5.2	62
Valdosta	200	1013.9	1022.5	66	39	52.8	-1.2	79	20	25	9	0	8	40	--	1.36	-2.19	.79	5	0	.0	0	8.5	S	--	---	--	13	12	6	4.6	--
IDAHO																																
Boise	1842	921.4	1020.4	36	22	29.1	+1.2	56	17	1	30	0	29	22	76	1.66	-.07	.61	12	0	10.3	3	12.5	ESE	34	SW	17	5	5	21	7.6	39
Lewiston	1413	965.5	1018.8	40	26	33.2	----	55	16	1	30	0	23	25	72	.51	-----	.26	9	0	.8	1	7.6	E	--	---	--	5	4	22	7.8	--
Pocatello	4444	862.9	1021.1	33	15	23.8	+1.5	45	15	-9	29	0	30	18	76	.44	-.90	.10	11	0	7.9	4	10.9	SW	43	SW	17	5	8	18	7.4	34
ILLINOIS																																
Cairo CO	314	1006.4	1019.6	46	30	37.9	+3.0	68	20	7	30	0	16	--	--	6.81	+3.05	2.62	13	1	11.3	5	11.4	---	34	SW	20	--	--	--	6.7	45
Chicago	618	992.6	1018.5	31	16	23.5	+1.2	53	18	-15	30	0	30	16	75	1.81	-.09	1.24	10	0	6.2	6	10.6	SSW	42	NW	20	4	5	22	7.8	44
Joliet	580	995.9	1018.6	31	15	22.5	+.1	54	18	-16	30	0	30	18	84	2.22	+.40	1.42	10	0	7.4	4	10.7	S	--	---	--	4	7	20	7.7	--
Moline	589	996.3	1020.1	29	13	20.6	+.4	57	19	-14	30	0	31	14	76	1.05	-.37	.35	9	0	7.1	4	7.2	W	36	SW	16	5	10	16	7.1	43
Peoria	659	995.9	1019.2	33	16	24.3	+.2	59	19	-11	30	0	27	19	80	1.58	-.20	1.21	8	0	4.8	2	11.7	NNW	31	S	16	5	7	19	7.3	43
Springfield CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Springfield	598	995.3	1019.2	36	20	27.9	+3.2	64	19	-6	30	0	26	21	77	1.77	-.33	1.16	10	0	2.9	2	15.5	NW	40	S	16	--	--	--	7.0	43

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA																																
Evansville	385	1004.1	1020.3	42	25	33.5	+1.9	69	19	-6	8	0	22	27	78	6.75	+3.01	2.50	13	0	12.3	8	10.6	NNW	34	W	20	--	--	--	7.2	39
Fort Wayne	801	985.8	1018.5	34	21	27.4	+2.0	59	20	1	30	0	27	23	83	2.38	+.05	.91	14	0	10.7	5	10.4	SSW	49	SW	20	0	8	23	8.6	29
Indianapolis CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Indianapolis	796	988.5	1019.2	37	21	29.1	+1.8	62	18	-1	30	0	27	24	81	2.95	.00	1.28	10	0	10.8	4	12.9	SSW	60	W	20	--	--	--	7.7	35
South Bend	768	988.2	1017.5	33	19	25.8	+1.0	52	18	-8	30	0	29	22	83	2.17	+.03	.98	14	0	12.8	6	12.6	SSW	*36	NW	20	1	4	26	9.1	--
Terre Haute	585	997.3	1019.6	38	22	29.9	+1.2	62	19	-3	30	0	27	23	77	2.62	-.08	.97	12	0	11.2	4	11.0	S	34	W	20	--	--	--	7.1	45
IOWA																																
Burlington	605	992.6	1019.3	31	14	22.4	+.3	61	19	-11	29	0	29	17	82	.80	-.91	.20	9	0	6.3	4	10.7	NNW	36	NW	20	3	8	20	7.7	48
Charles City CO	1013	981.0	1020.3	21	1	11.0	-2.7	42	16	-30	30	0	31	--	--	.84	-.21	.33	9	0	10.6	13	6.1	---	25	S	22	9	13	9	5.7	50
Davenport CO	579	996.3	------	29	14	21.4	-.4	60	19	-14	30	0	27	--	--	1.23	-.19	.36	9	0	8.2	4	----	---	--	---	--	--	--	--	---	--
Des Moines	800	987.1	1020.1	30	11	20.4	+.3	60	18	-11	29	0	31	12	72	.59	-.48	.22	3	0	4.3	2	12.1	NW	42	W	15	--	--	--	6.9	57
Dubuque CO	641	------	------	26	9	17.0	-2.1	46	18	-26	29	0	31	--	--	1.41	+.11	.44	10	0	11.8	8	----	---	--	---	--	--	--	--	---	--
Sioux City	1097	977.0	1020.3	28	6	17.1	+.8	57	18	-16	30	0	31	9	72	.21	-.53	.09	4	0	3.2	2	9.4	NW	36	NW	15	7	11	13	6.6	54
KANSAS																																
Concordia CO	1375	968.2	1020.0	37	18	27.2	+.8	68	18	-2	28	0	28	--	--	.48	-.13	.27	4	0	3.6	2	8.5	---	28	SW	16	--	--	--	5.3	64
Dodge City	2594	928.2	1019.0	40	17	28.8	-.2	78	26	-8	31	0	31	15	64	.55	+.14	.29	5	1	6.2	2	13.8	NNE	43	NE	27	10	6	15	5.6	74
Goodland	3645	887.6	1019.0	41	12	26.3	-2.4	79	26	-19	31	0	31	13	67	.28	+.02	.09	7	0	7.1	3	10.7	SW	35	NW	3	9	10	12	5.8	--
Topeka CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Topeka	926	986.5	1019.9	40	18	29.0	----	71	18	-2	29	0	31	18	70	1.00	-----	.79	7	0	2.4	2	9.8	NW	42	SW	16	--	--	--	6.5	47
Wichita	1372	968.8	1018.8	43	22	32.2	+.9	69	26	-2	29	0	29	19	63	1.03	+.25	1.01	3	1	.4	T	14.8	S	45	SW	22	--	--	--	5.5	69
KENTUCKY																																
Lexington	979	983.1	1019.8	43	27	34.9	+2.0	66	19	5	8	0	23	29	78	11.15	+6.97	2.98	16	0	8.0	4	14.3	S	--	---	--	6	6	19	7.3	--
Louisville CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Louisville	485	1002.7	1019.5	44	28	35.7	+2.3	68	19	8	8	0	21	30	77	7.83	+3.83	2.67	15	1	7.0	3	11.6	S	45	SW	17	5	6	20	7.6	35
LOUISIANA																																
Baton Rouge	64	1017.6	1020.5	64	43	53.4	+.3	76	18	28	9	0	5	43	75	5.50	-.02	1.33	11	5	.0	T	8.5	SE	--	---	--	--	--	--	5.6	--
Lake Charles	12	1018.6	1019.8	64	41	52.7	+1.0	77	20	24	31	0	6	46	84	7.28	+2.56	2.53	13	6	.5	T	11.6	N	--	---	--	--	--	--	5.8	--
New Orleans CO	12	1019.0	------	67	48	57.4	+3.2	78	20	36	8	0	0	--	--	5.17	+.83	2.00	10	2	.0	0	7.3	---	21	NW	14	--	--	--	5.4	49
New Orleans	12	1019.0	1020.7	67	45	55.6	----	78	20	29	9	0	2	47	79	5.49	-----	1.23	11	2	.0	0	10.3	S	*45	W	14	--	--	--	5.2	--
Shreveport	174	1010.5	1019.8	60	37	48.2	+.6	79	19	15	31	0	9	37	74	5.43	+1.50	1.87	11	6	4.4	4	12.4	SSE	35	W	14	--	--	--	5.6	59
MAINE																																
Caribou	624	991.2	1015.5	23	5	13.6	+6.7	40	4	-32	31	0	31	7	73	2.90	+.50	.79	14	0	23.4	22	13.9	W	*53	W	5	5	8	18	7.2	--
Eastport	33	1012.5	1015.6	35	19	29.6	+6.5	54	4	-14	31	0	28	--	--	4.09	+.17	1.71	12	0	15.8	7	12.1	---	36	NE	7	8	6	17	6.6	52
Portland	61	1012.5	1016.4	35	16	25.5	+5.4	52	4	-11	31	0	29	18	73	2.94	-1.03	.80	12	0	19.0	9	9.4	WNW	50	SE	24	4	10	17	6.9	59
MARYLAND																																
Baltimore CO	14	------	------	47	31	38.8	+5.0	70	20	19	31	0	20	--	--	2.85	-.65	.89	10	0	----	--	9.8	---	48	NW	21	--	--	--	---	37
Baltimore	146	1015.6	1020.1	46	28	36.9	----	71	20	15	9	0	22	26	66	2.88	-----	.88	10	0	2.5	2	11.0	S	--	---	--	4	11	16	6.9	--
Frederick	294	------	------	45	26	35.1	----	68	†20	15	†9	0	27	--	--	2.11	-----	.46	24	0	1.0	1	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Boston	12	1012.9	1017.5	42	26	34.0	+6.1	61	19	1	31	0	23	22	64	4.04	+.43	1.12	11	0	13.9	7	13.0	WNW	37	W	21	6	8	17	6.8	55
Nantucket	43	1017.3	1017.6	43	29	35.8	+4.5	53	4	14	22	0	20	29	78	3.48	-.29	1.16	14	1	1.0	1	13.3	NW	36	SW	15	7	4	20	7.2	33
Pittsfield	1153	973.2	1017.6	34	16	25.1	+3.4	56	20	-1	31	0	30	--	--	3.15	+.11	.75	19	0	13.1	6	9.4	---	--	---	--	3	8	20	7.8	--
MICHIGAN																																
Alpena CO	587	993.6	1016.9	28	13	20.2	+1.1	43	17	-15	30	0	31	--	--	2.63	+.74	.79	17	0	25.8	9	9.9	---	37	SE	22	2	9	20	7.6	48
Detroit	619	989.8	1017.9	34	22	27.8	+3.7	57	20	-4	30	0	26	21	80	1.91	-.16	.68	16	0	15.4	7	10.2	NW	36	N	21	--	--	--	8.5	30
Escanaba CO	594	993.9	1017.6	24	9	16.2	+.8	41	17	-22	30	0	31	--	--	.63	-.86	.28	8	0	8.1	13	10.3	---	43	N	20	--	--	--	7.0	45
Grand Rapids CO	638	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Grand Rapids	638	991.2	1017.5	31	18	24.4	+2.2	50	18	-22	30	0	30	19	83	2.25	-.10	.69	15	0	18.4	10	10.2	W	31	SW	3	--	--	--	8.9	30
Lansing	859	983.7	1018.1	30	19	24.4	+2.5	46	18	-14	30	0	30	20	83	2.52	+.70	.78	17	0	11.4	8	14.7	W	34	SE	22	--	--	--	8.3	19
Marquette CO	677	988.5	1016.9	24	12	17.9	+1.6	43	18	-17	30	0	31	--	--	1.32	-1.01	.67	13	0	19.1	28	8.5	---	26	SW	18	--	--	--	8.2	32
Muskegon	627	993.2	1017.4	30	20	24.7	-.1	46	18	-6	30	0	30	20	82	2.21	+.04	.56	15	0	19.6	11	9.3	E	--	---	--	1	2	28	9.2	--
Sault Ste. Marie	721	993.2	1017.1	22	7	14.4	+2.3	41	18	-22	30	0	31	8	79	.85	-1.17	.26	11	0	15.1	23	7.8	E	30	NW	15	--	--	--	7.4	39
Ypsilanti	722	988.2	1017.6	33	21	27.1	----	56	20	-5	30	0	28	20	77	1.65	-----	.46	11	1	13.2	6	11.3	SW	26	WSW	4	1	8	22	8.5	--
MINNESOTA																																
Duluth CO	1128	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Duluth	1128	997.3	1018.3	15	-5	5.1	----	33	1	-35	29	0	31	-2	74	.49	-----	.17	7	0	7.2	21	9.0	NW	34	NW	24	--	--	--	6.3	47
Intern'l Falls	1179	972.9	1019.5	11	-11	-.3	-3.4	31	1	-41	29	0	31	-6	77	.39	-.47	.13	8	0	5.0	15	----	---	--	---	--	13	6	12	5.3	--
Minneapolis	830	983.7	1019.8	19	0	9.3	-3.4	40	16	-29	30	0	31	2	76	.44	-.42	.18	8	0	7.1	14	9.7	WNW	33	SE	22	--	--	--	6.3	56
Rochester	1014	980.7	1020.2	18	-4	7.4	-4.1	41	13	-40	30	0	31	2	74	.85	-.25	.30	8	0	12.4	15	8.7	WNW	--	---	--	7	7	17	6.9	--
St. Cloud	1034	979.3	1020.0	16	-8	3.9	-6.4	37	16	-40	30	0	31	-4	72	.35	-.39	.14	10	0	5.5	11	7.6	WNW	--	---	--	9	7	15	5.9	--
St. Paul	703	991.9	1019.9	19	-1	9.0	-3.6	40	16	-32	30	0	31	2	74	.53	-.39	.21	8	0	7.9	11	10.1	NW	*28	SE	22	9	7	15	6.6	--
MISSISSIPPI																																
Jackson	315	1008.5	1020.6	60	38	49.1	+.5	75	19	22	31	0	10	40	74	8.63	+3.69	3.69	15	6	2.4	2	10.0	SSE	34	NW	6	8	10	13	5.9	53
Meridian	294	1007.5	1021.4	61	36	48.7	+3.4	75	13	19	8	0	13	40	76	4.77	-.55	1.37	10	2	T	T	7.9	SSE	--	---	--	10	9	12	5.9	--
Vicksburg	234	1012.2	------	59	40	49.8	+1.6	74	19	20	31	0	7	--	--	8.33	+2.96	2.87	11	4	1.2	1	10.1	---	26	SW	17	9	9	13	6.0	45
MISSOURI																																
Columbia	733	990.2	1019.0	40	21	30.8	+1.5	70	19	-6	29	0	25	21	75	2.30	+.38	1.90	9	1	2.4	2	11.8	S	56	NW	15	--	--	--	6.7	52
Kansas City	741	983.1	1019.3	40	22	30.7	+2.5	70	18	-2	29	0	25	18	64	1.07	-.17	.77	6	0	3.5	3	9.1	S	42	S	22	--	--	--	6.8	54
St. Joseph	809	983.1	1019.4	38	17	27.3	+1.8	69	18	-2	29	0	31	16	70	.65	-.63	.25	7	0	3.3	3	11.1	NNW	35	S	22	9	6	16	6.4	51
St. Louis CO	465	997.6	------	41	25	33.1	+2.0	70	18	-3	29	0	21	--	--	2.21	-.13	.95	10	0	4.5	4	13.0	---	40	SW	16	--	--	--	5.9	49
St. Louis	465	997.6	1018.8	42	24	32.6	+2.8	70	18	-3	29	0	25	23	73	1.67	-.59	.66	10	0	5.9	4	9.6	NW	--	---	--	--	--	--	6.5	--
Springfield	1265	969.9	1018.9	44	23	33.6	+1.3	72	19	-3	29	0	25	22	72	2.39	+.05	1.53	11	0	2.0	1	14.0	SSE	43	SW	17	7	7	17	6.7	52
MONTANA																																
Billings	3568	889.6	1018.6	30	11	20.5	-1.9	50	15	-22	28	0	31	11	70	.64	-----	.21	12	0	9.6	4	12.2	WSW	58	NW	22	9	5	17	6.4	45
Butte	5530	825.6	1022.2	24	-4	10.0	-4.4	44	25	-46	29	0	31	4	71	.92	+.52	.21	13	0	14.3	10	8.4	S	--	---	--	7	3	21	7.2	--
Glasgow CO	2090	941.1	1020.6	18	-5	6.4	-2.6	42	17	-30	28	0	31	-1	70	1.40	+.89	.76	11	0	15.0	10	----	---	--	---	--	11	4	16	6.0	--
Great Falls	3663	885.2	1018.3	27	9	18.2	-5.7	50	15	-25	27	0	31	7	63	.41	-.20	.14	8	0	5.0	5	17.1	SW	57	S	21	5	7	19	7.2	44
Havre CO	2488	925.8	1019.6	21	1	11.0	-1.9	49	15	-26	27	0	31	--	--	.39	-.34	.17	6	0	6.2	5	9.6	---	32	SW	21	8	9	14	6.4	51
Helena	3893	871.7	1020.7	26	8	16.9	-1.9	49	15	-27	29	0	31	8	69	.38	-.18	.16	12	0	5.8	4	6.3	W	45	W	2	5	5	21	7.3	61
Kalispell	2965	910.9	1018.6	28	9	18.9	----	42	25	-22	28	0	31	13	79	1.24	-----	.23	17	0	16.2	9	7.9	S	--	---	--	4	3	24	8.5	--
Miles City	2629	931.6	1019.7	26	5	15.4	----	50	17	-21	28	0	31	10	--	.08	-----	.03	6	0	3.1	1	9.1	WNW	--	---	--	9	8	14	6.2	--
Missoula	3201	901.5	1020.6	27	11	18.9	+.3	47	15	-19	29	0	31	14	81	1.08	+.23	.27	19	0	11.6	4	5.4	ESE	37	SW	15	5	6	25	8.0	23
NEBRASKA																																
Grand Island	1841	950.2	1019.2	33	10	21.4	----	65	18	-9	31	0	30	12	71	.53	-----	.37	6	0	10.9	5	12.2	NNW	--	---	--	7	8	16	6.5	--
Lincoln CO	1184	975.3	------	32	14	22.9	+.1	65	18	-5	29	0	29	--	--	.71	+.07	.24	7	0	8.3	3	8.8	---	34	NW	23	--	--	--	---	73
Lincoln	1180	975.3	1020.1	32	10	21.1	+.3	66	18	-5	29	0	31	12	73	.73	+.09	.26	5	0	8.3	4	9.2	NNW	--	---	--	--	--	--	6.6	--
Norfolk	1554	962.1	1020.6	31	8	19.1	-1.5	61	18	-13	30	0	31	10	71	.12	-.54	.09	2	0	2.1	1	13.1	NNW	--	---	--	--	--	--	6.5	--
North Platte	2783	916.0	1018.6	38	11	24.5	+1.6	69	26	-15	31	0	31	11	64	.20	-.19	.08	6	0	2.1	1	9.8	N	47	NW	26	7	8	16	6.7	46
Omaha	978	978.3	1020.3	31	10	20.3	-.6	53	18	-8	29	0	30	13	74	.66	-.04	.24	4	0	6.1	3	11.2	N	37	NW	20	--	--	--	6.6	47
Scottsbluff	3950	877.8	1019.0	38	10	24.4	-1.7	61	18	-20	31	0	31	10	60	.36	-.02	.14	8	0	8.1	6	8.8	WNW	--	---	--	8	6	17	6.7	--
Valentine CO	2581	923.5	1019.3	32	7	19.7	+.8	60	16	-19	28	0	31	--	--	.05	-.43	.04	3	0	.5	T	8.2	---	28	N	14	5	11	15	6.6	54

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2–Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEVADA																																
Elko	5075	844.9	1020.4	36	13	24.4	----	50	15	-15	20	0	30	18	78	2.08	-----	1.27	9	0	22.2	14	6.9	SW	--	---	--	7	7	17	6.8	--
Ely	6257	807.7	1020.0	39	11	25.3	+2.4	68	25	-16	31	0	31	--	--	.13	-.87	.04	5	0	1.7	1	11.3	---	42	SE	15	5	8	18	7.1	42
Las Vegas	2162	940.7	1018.1	56	32	43.8	+1.6	71	24	22	31	0	17	22	45	.19	-.43	.16	2	0	T	T	6.4	W	--	---	-	9	7	15	5.7	80
Reno	4404	862.2	1018.7	46	20	33.1	+2.2	59	24	-3	20	0	28	22	66	.98	-.56	.80	6	0	10.5	8	6.2	S	52	S	15	4	8	19	7.5	53
Winnemucca	4299	870.0	1019.7	42	20	30.8	+2.2	60	25	-2	31	0	30	22	69	1.16	+.13	.51	8	0	6.3	4	9.6	---	49	W	17	5	7	19	7.2	37
NEW HAMPSHIRE																																
Concord	339	1006.5	1017.2	36	15	25.2	+6.2	58	4	-8	31	0	29	16	69	2.43	-.57	.73	11	0	12.9	7	6.0	NW	28	NW	30	5	8	18	7.2	60
Mt. Washington	6262	797.2	1018.3	18	-1	8.6	+2.6	37	†4	-27	30	0	31	--	77	1.80	-4.13	.28	16	0	14.5	14	45.2	W	*114	WNW	4	2	6	23	8.3	31
NEW JERSEY																																
Atlantic City CO	8	1017.3	1019.3	45	32	38.2	+5.7	62	19	18	9	0	17	--	--	2.57	-.92	.99	9	0	.7	T	17.1	---	54	SE	15	8	7	16	6.2	62
Newark	11	1017.6	1018.9	44	27	35.4	+5.6	64	19	10	31	0	24	24	66	4.06	+.26	1.28	12	0	5.1	3	11.1	SW	45	WSW	15	6	7	18	7.0	--
Trenton CO	56	1012.2	1019.3	43	28	35.6	+5.1	65	19	13	31	0	24	--	--	3.13	-.18	1.05	11	0	2.5	1	9.8	---	34	NW	21	7	8	16	6.7	52
NEW MEXICO																																
Albuquerque	5310	848.0	1016.6	49	25	36.6	+2.5	63	27	5	31	0	27	15	43	.41	+.01	.32	3	0	6.0	3	8.9	N	40	E	29	14	7	10	4.6	75
Clayton	4969	845.9	1017.7	45	17	30.6	-3.4	77	26	-12	31	0	30	15	60	.84	+.58	.41	6	0	8.9	4	15.6	W	--	---	--	12	8	11	5.4	--
Raton	6379	801.9	1017.6	41	10	25.6	----	69	26	-13	31	0	31	10	56	.65	-----	.51	5	0	9.1	7	8.8	NE	--	---	--	7	10	14	5.9	--
Roswell	3611	891.6	1017.8	57	20	38.3	-.9	75	19	4	31	0	29	13	40	.09	-.44	.09	1	0	1.3	1	7.9	SSE	40	NE	2	17	9	5	3.6	75
NEW YORK																																
Albany	277	1014.2	1017.8	34	18	25.9	+5.8	53	20	-8	9	0	28	18	73	2.36	-.04	.75	15	0	9.9	6	9.9	WNW	52	NW	21	3	9	19	7.6	35
Bear Mountain	1300	------	------	36	23	29.5	----	60	19	-2	31	0	25	--	--	4.60	-----	2.03	14	1	8.4	4	----	---	--	---	--	6	11	14	6.3	--
Binghamton CO	858	------	------	38	21	29.5	+5.4	63	20	4	30	0	27	--	--	2.90	+.45	.80	19	0	15.4	8	----	---	26	W	†4	2	3	26	8.6	32
Binghamton	828	985.8	1018.2	37	19	28.3	----	62	20	2	30	0	30	20	72	1.88	-----	.69	13	0	11.9	6	6.8	WSW	--	---	--	3	2	26	8.6	--
Buffalo	693	988.8	1017.9	35	22	28.5	+4.6	62	20	5	30	0	26	22	77	2.63	-.67	.99	24	1	13.7	4	14.9	W	57	W	21	1	4	26	8.8	31
New York CO	10	1006.8	------	44	29	36.5	+5.6	63	20	14	30	0	22	--	--	3.38	-.28	1.09	11	0	5.2	4	16.0	---	66	W	21	8	7	16	6.5	53
New York	12	1017.3	1018.9	44	30	36.8	----	64	19	11	31	0	20	26	65	4.27	-----	1.25	10	0	5.4	3	14.5	SW	47	NW	16	8	4	19	6.7	--
Oswego	292	1004.7	1017.6	35	21	27.8	+4.2	59	21	0	31	0	28	--	--	3.55	+.64	.63	21	1	25.5	10	10.9	---	35	W	21	1	6	24	8.7	18
Rochester	543	997.6	1017.5	35	20	27.4	+4.4	58	20	1	31	0	29	22	79	2.89	0	.49	23	1	27.6	8	11.2	W	57	W	21	1	8	22	8.2	17
Syracuse	399	994.9	1017.9	35	18	26.7	+3.9	61	20	-3	31	0	30	20	73	2.73	+.01	.74	22	1	21.1	8	10.1	W	45	W	21	1	7	23	8.7	24
NORTH CAROLINA																																
Asheville CO	2203	------	------	49	29	38.7	+3.3	68	20	15	9	0	22	--	--	1.07	-2.03	.35	10	0	.9	T	----	---	33	NW	7	9	5	17	6.6	48
Asheville	2093	945.8	1022.0	--	--	----	----	--	--	--	--	--	--	29	77	-----	-----	----	--	--	----	--	7.9	NNW	--	---	--	--	--	--	---	--
Charlotte CO	741	992.9	------	53	34	43.5	+2.3	66	29	21	9	0	15	--	--	1.48	-2.52	.42	9	0	.0	0	----	---	27	S	4	10	7	14	6.0	52
Charlotte	753	993.2	1021.7	53	31	42.3	+2.8	71	20	17	9	0	18	31	68	1.47	-2.53	.41	7	0	.0	0	8.4	SW	--	---	--	10	7	14	6.0	--
Greensboro	891	989.2	1021.9	51	28	39.7	-.3	70	20	11	9	0	22	29	70	1.60	-1.69	.47	10	0	T	T	9.6	SW	29	SW	20	12	3	16	6.1	54
Hatteras	4	1021.3	1021.7	55	42	48.5	+1.4	65	20	28	9	0	3	42	77	1.04	-3.38	.45	9	0	.0	0	13.7	SW	34	SW	27	10	6	15	6.2	62
Raleigh CO	400	------	------	55	33	44.1	+3.0	73	20	19	9	0	16	--	--	1.69	-1.97	1.05	8	0	T	0	7.5	---	25	SW	15	12	10	9	4.9	57
Raleigh	438	1005.4	1021.5	55	32	43.1	----	74	20	15	9	0	20	30	66	1.57	-----	.66	9	0	T	T	8.8	SW	--	---	--	12	8	11	5.3	--
Wilmington CO	6	1021.0	1022.4	58	40	49.1	+2.6	73	20	24	9	0	6	--	--	.45	-2.84	.24	5	0	.0	0	10.1	---	43	SW	15	8	11	12	5.9	50
Wilmington	30	1021.3	1022.2	--	--	----	----	--	--	--	--	--	--	40	--	-----	-----	----	--	--	----	--	6.6	SW	--	---	--	--	--	--	---	--
Winston-Salem	967	985.4	1021.7	50	31	40.4	+1.9	69	20	16	9	0	20	26	59	1.50	-1.86	.36	9	0	T	T	10.3	WSW	--	---	--	11	5	15	5.9	--
NORTH DAKOTA																																
Bismarck	1653	956.3	1021.2	14	-9	2.9	-3.4	43	17	-37	29	0	31	-4	76	.55	+.10	.18	11	0	8.4	9	8.6	WNW	47	W	22	11	5	15	5.9	75
Devils Lake CO	1471	963.1	1021.0	9	-9	-.5	-2.3	37	16	-36	29	0	31	--	--	.69	+.22	.26	11	0	9.4	13	8.8	---	31	NW	23	--	--	--	4.9	65
Fargo	895	983.1	1020.2	11	-8	1.1	-2.7	38	16	-36	29	0	31	-6	73	.45	-.22	.16	12	0	5.7	9	12.5	NNW	44	W	23	--	--	--	5.1	63
Williston CO	1877	948.2	1020.2	15	-3	5.8	-.6	42	17	-34	29	0	31	-2	72	.75	+.21	.34	8	0	7.9	9	6.8	---	35	W	22	--	--	--	8.3	55
OHIO																																
Akron	1210	972.6	1018.7	35	22	28.2	+.8	60	20	5	30	0	26	23	80	3.09	+.49	.85	17	0	13.0	5	11.2	S	--	---	--	2	3	26	8.6	--
Cincinnati CO	553	995.9	------	43	29	35.7	+3.4	65	18	10	30	0	20	--	--	6.22	+2.74	1.77	13	0	9.7	5	14.1	---	56	W	20	--	--	--	---	36
Cincinnati	871	986.5	1019.2	40	25	32.6	----	64	19	5	8	0	21	26	76	6.65	-----	1.68	15	0	12.8	4	12.6	S	--	---	--	4	6	21	7.8	--
Cleveland CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Cleveland	787	989.5	1018.2	36	24	29.9	+5.2	62	20	5	30	0	26	24	79	3.72	+1.21	1.01	21	0	17.5	7	13.2	S	45	W	20	3	4	24	8.3	24
Columbus CO	724	------	------	39	26	32.4	+3.8	62	20	5	8	0	24	--	--	3.80	+.74	1.21	12	0	3.8	2	11.8	---	40	W	21	3	7	21	8.2	37
Columbus	815	988.2	1019.1	39	24	31.4	+4.5	62	20	3	9	0	25	25	77	4.50	+1.13	1.24	14	0	6.2	3	13.2	S	32	W	21	2	4	25	8.4	--
Dayton	1002	981.4	1018.9	36	23	29.5	+1.8	61	20	-4	8	0	26	25	81	3.88	+.65	1.26	14	0	15.1	6	14.5	S	47	SW	20	3	6	22	8.1	40
Sandusky	603	994.6	------	36	24	30.3	+4.0	63	20	5	30	0	24	--	--	2.37	+.11	.37	17	0	12.7	5	10.1	---	34	SW	20	3	5	23	8.1	35
Toledo	621	993.9	1018.0	34	22	27.8	+3.3	60	20	0	30	0	26	23	81	2.16	0	.62	12	0	12.2	4	12.4	SSW	42	NW	21	2	6	23	8.4	25
Youngstown	1178	974.3	1018.4	36	22	28.8	+2.1	61	20	4	30	0	26	22	78	2.96	+.51	.70	20	0	11.3	3	11.6	SW	*47	WSW	21	3	4	24	8.4	--
OKLAHOMA																																
Oklahoma City CO	1254	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Oklahoma City	1254	971.2	1019.2	50	27	38.9	+2.5	73	19	3	29	0	21	22	61	1.52	+.33	1.04	5	1	2.3	1	17.8	N	47	S	22	--	--	--	5.3	--
Tulsa	672	993.9	1018.8	50	27	38.7	+3.4	75	19	4	29	0	22	23	61	2.07	+.39	1.01	6	1	1.0	1	13.7	N	41	S	26	--	--	--	5.8	57
OREGON																																
Baker	3369	------	------	--	--	----	----	--	--	--	--	--	--	18	--	-----	-----	----	--	--	----	--	----	SE	--	---	--	--	--	--	---	--
Baker CO	3446	895.4	1020.4	33	17	25.3	+.3	49	15	-14	29	0	31	--	--	1.18	-.21	.30	11	0	14.2	7	6.2	---	47	SW	2	4	7	20	7.8	32
Burns CO	4140	872.3	1019.3	34	14	23.9	-.7	47	26	-9	30	0	31	18	76	2.10	+.55	.47	13	0	28.0	11	----	---	--	---	--	7	3	21	7.4	--
Eugene	364	1004.1	1017.9	47	34	40.6	----	63	24	14	30	0	9	36	86	8.85	-----	1.62	21	0	1.4	T	10.8	S	--	---	--	2	4	25	8.5	--
Meacham	4050	874.4	1018.7	30	18	24.0	----	46	24	-11	29	0	31	20	84	4.60	-----	1.00	23	0	38.9	21	7.9	ESE	--	---	--	3	2	26	8.7	--
Medford	1314	970.9	1019.7	46	32	38.9	+1.0	55	15	15	30	0	15	33	82	4.05	+1.74	1.67	19	0	1.5	1	6.6	N	*40	SE	20	3	0	28	9.0	--
Pendleton	1489	963.8	1018.8	41	27	33.7	+2.1	59	24	-4	29	0	21	26	75	1.99	+.21	.50	13	0	3.3	3	10.3	SSE	--	---	--	2	5	24	8.4	--
Portland CO	30	------	------	45	36	40.3	+.9	58	24	18	25	0	5	--	--	9.58	+2.98	1.62	22	0	T	T	----	---	--	---	--	--	--	--	---	--
Portland	21	1016.3	1017.6	45	35	39.8	+2.3	58	24	16	30	0	7	33	78	7.71	-----	1.27	24	0	.2	T	10.9	SE	54	S	15	3	3	25	8.4	33
Roseburg CO	479	1000.0	1019.0	49	36	42.2	+1.0	63	24	16	30	0	8	--	--	6.85	+1.54	1.85	21	0	4.4	4	4.4	---	24	S	2	2	3	26	8.7	20
Salem	195	1010.2	1017.5	45	35	39.8	+.2	57	24	16	30	0	7	35	84	9.49	+4.06	1.57	22	0	.1	T	10.2	S	--	---	--	3	1	27	8.7	--
Sexton Summit CO	3836	------	------	37	27	32.1	----	49	24	12	29	0	27	--	--	6.54	-----	1.31	20	0	32.7	14	----	---	--	---	--	3	4	24	8.5	--
Troutdale	29	------	------	44	34	39.1	----	58	24	19	28	0	5	33	80	9.84	-----	1.70	25	0	.2	T	13.1	E	*45	S	15	3	2	26	8.5	--
PENNSYLVANIA																																
Allentown	381	1005.1	1019.6	39	23	31.2	+1.9	59	19	10	31	0	28	24	76	4.05	+.55	1.25	12	0	7.0	4	9.2	WNW	--	---	--	4	8	19	7.3	--
Curwensville	2215	------	------	35	18	26.7	----	60	20	4	30	0	27	21	81	5.79	-----	1.14	19	2	27.6	12	12.2	W	35	WSW	4	2	1	28	8.9	--
Erie CO	655	------	------	37	25	31.1	+4.3	63	20	8	30	0	26	--	--	3.59	+.82	1.02	20	0	18.2	6	9.9	---	33	SW	20	1	6	24	8.5	19
Harrisburg	335	1006.4	1019.9	41	26	33.5	+4.5	68	20	13	9	0	25	23	69	3.65	+.56	1.27	11	1	4.4	3	7.5	WNW	40	SW	21	4	9	18	7.3	44
Park Place	1932	------	------	35	21	27.7	----	57	20	3	31	0	28	--	--	4.05	-----	1.80	14	0	10.6	6	----	---	--	---	--	5	6	20	7.7	--
Philadelphia CO	26	------	------	45	30	37.5	+4.9	66	20	16	31	0	21	--	--	4.14	+.84	1.40	8	0	2.9	2	----	---	29	SW	15	6	11	14	6.6	53
Philadelphia	13	1018.3	1019.5	44	28	36.0	+4.9	65	20	17	31	0	25	27	70	3.83	+.53	1.38	12	0	2.4	1	10.1	WNW	45	WNW	21	5	8	18	7.2	--
Pittsburgh CO	----	------	------	43	28	35.4	+4.7	70	20	10	30	0	23	--	--	4.32	+1.27	1.17	18	--	7.3	--	----	---	--	---	--	--	--	--	---	26
Pittsburgh	1248	987.8	1018.9	40	26	33.0	+4.8	68	20	8	30	0	26	24	71	4.90	+1.85	1.42	17	0	12.4	7	11.1	S	40	SW	21	2	5	24	8.4	35
Reading CO	266	1007.1	1019.6	43	28	35.4	+4.3	68	20	14	31	0	21	--	--	3.84	+.27	1.58	12	0	4.9	3	11.7	---	45	W	21	5	6	20	7.3	47
Scranton CO	746	988.5	1018.6	39	24	31.3	+4.7	63	20	7	31	0	25	--	--	2.77	-.26	.97	13	0	8.2	5	6.8	---	31	SE	23	5	10	16	7.1	32
Williamsport	527	999.7	1019.1	38	21	29.7	+2.1	61	20	1	9	0	29	20	69	3.71	+.89	1.30	13	1	12.2	6	9.7	W	66	W	21	3	6	22	7.8	--
RHODE ISLAND																																
Block Island	26	------	------	42	29	35.7	+4.7	56	4	10	31	0	21	--	--	3.71	-.07	1.27	12	1	4.4	1	----	---	--	---	--	8	5	18	6.7	--
Providence CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Providence	55	1011.9	1018.0	41	25	33.1	+7.4	62	19	4	31	0	23	24	69	4.50	+.80	1.68	11	0	7.9	3	10.3	NW	43	SW	4	8	5	18	7.0	50

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point		Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy		
												Max. 90° F. or above	Min. 32° F. or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date					
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
SOUTH CAROLINA																																
Charleston CO	9	1020.3	------	59	42	50.8	+0.9	72	†19	29	26	0	4	--	--	0.89	-2.13	0.35	8	0	0.0	0	----	---	31	S	15	11	9	11	5.2	64
Charleston	41	1021.0	1022.6	62	37	49.2	+1.5	75	20	21	10	0	10	40	74	.76	-2.26	.28	5	0	.0	0	8.5	SW	--	---	--	9	10	12	5.6	--
Columbia CO	332	1009.5	------	57	38	47.2	+1.2	73	20	24	†9	0	8	--	--	1.46	-1.96	.48	7	0	.0	0	----	---	33	SW	15	12	8	11	5.1	56
Columbia	217	1013.5	1022.1	58	34	45.8	----	75	20	18	10	0	12	35	72	1.50	-----	.60	8	0	.0	0	6.9	SW	--	---	--	13	6	12	5.3	--
Florence	146	1016.3	1022.0	59	35	46.8	----	75	20	20	9	0	12	35	70	.94	-----	.30	7	0	.0	0	8.3	SSW	--	---	--	8	11	12	5.6	--
Greenville	1006	983.1	1021.4	51	33	42.3	+2.0	67	20	20	9	0	14	31	70	1.59	-3.28	.50	13	0	T	T	8.0	SW	38	SW	15	11	3	17	6.1	56
Spartanburg	801	991.2	1022.1	52	32	41.9	-0.2	69	20	18	9	0	14	32	72	1.65	-2.58	.72	10	0	T	T	9.0	SW	*48	NW	14	12	3	16	6.0	--
SOUTH DAKOTA																																
Huron	1282	970.5	1020.6	22	0	11.0	-.3	46	22	-23	29	0	31	3	75	.24	-.32	.17	5	0	4.6	4	10.6	NW	40	NW	23	7	12	12	6.3	48
Rapid City	3215	967.8	1019.3	33	9	20.8	+.8	55	16	-25	29	0	31	7	63	.12	-.33	.07	4	0	1.2	1	11.1	NNW	49	NW	14	7	8	16	6.5	61
Sioux Falls	1420	965.5	1020.4	24	2	13.1	-2.7	52	16	-20	7	0	31	4	73	.20	-.47	.18	3	0	4.6	4	10.5	NW	*38	NW	15	8	8	15	6.3	--
TENNESSEE																																
Bristol	1519	976.6	1020.9	50	28	38.7	-.2	68	3	11	9	0	23	30	73	3.24	-.41	.71	17	0	1.4	T	7.9	NE	--	---	--	3	9	19	7.4	--
Chattanooga	670	992.9	1021.4	53	32	42.4	+3.3	68	19	16	26	0	19	33	71	4.59	-.67	1.94	16	2	T	T	7.2	S	44	W	15	8	5	18	6.8	38
Knoxville	949	984.4	1021.1	52	32	41.9	+4.2	69	19	16	9	0	20	33	74	5.02	+.36	1.31	16	1	T	0	10.4	SW	38	SW	20	6	8	17	7.1	38
Memphis CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Memphis	263	1005.1	1020.1	53	33	42.7	+3.0	71	19	14	30	0	17	34	73	12.21	+7.26	3.50	12	5	4.1	4	13.8	S	37	NW	15	10	2	19	6.5	44
Nashville	577	1000.0	1020.4	49	31	40.2	+1.6	69	19	15	8	0	17	33	77	10.54	+5.78	3.83	15	2	7.7	5	10.1	S	34	W	20	5	5	21	7.7	30
TEXAS																																
Abilene	1752	956.3	1018.4	58	31	44.5	+1.4	81	19	10	29	0	17	18	42	.05	-.91	.03	2	0	.5	T	16.0	S	52	S	9	12	7	12	5.1	67
Amarillo	3590	888.6	1017.3	49	21	34.8	+1.7	76	26	-7	31	0	28	17	58	.38	-.13	.15	5	0	4.3	3	13.7	NNE	43	S	11	--	--	--	4.7	66
Austin	515	997.6	1019.7	64	38	50.8	+1.3	83	18	16	30	0	8	33	58	.51	-1.56	.28	6	1	.6	1	10.4	S	38	NW	2	--	--	--	4.9	67
Big Spring	2533	928.5	1019.1	58	28	42.8	-1.7	75	19	8	29	0	19	18	43	.06	-.45	.03	2	0	.5	1	13.6	S	--	---	--	15	6	10	4.5	--
Brownsville	16	1015.9	1017.9	72	52	61.8	+2.0	83	20	25	30	0	3	50	74	.68	-1.13	.32	5	1	.0	0	13.4	SSE	40	NW	14	--	--	--	5.7	50
Corpus Christi	40	1018.6	1019.2	70	45	57.5	+3.5	84	18	22	30	0	4	47	76	.55	-1.01	.38	7	1	T	T	13.8	SSE	45	N	14	13	5	13	5.2	61
Dallas	487	1000.7	1019.3	58	34	46.3	+.9	82	19	13	29	0	12	30	59	2.00	-.39	.96	7	3	2.1	2	11.4	S	42	S	9	--	--	--	5.3	55
Del Rio CO	957	983.4	1018.3	65	39	51.9	-.4	81	19	19	30	0	5	30	48	T	-.56	T	0	0	T	T	8.3	---	38	NW	2	18	7	6	3.6	72
El Paso	3920	885.2	1016.0	58	30	44.2	+.6	70	27	18	31	0	20	16	35	.33	-.13	.32	3	0	3.8	4	10.2	S	43	W	17	--	--	--	3.7	80
Fort Worth	688	995.3	1019.9	58	34	46.0	+1.6	83	19	11	29	0	13	27	54	1.39	-.66	.48	5	3	1.8	2	15.9	S	49	WNW	13	--	--	--	5.2	--
Galveston CO	7	------	------	62	49	55.4	+1.6	72	20	21	31	0	2	--	--	3.45	+.04	1.32	12	0	T	T	14.1	---	40	NW	14	--	--	--	---	50
Galveston	7	1019.3	1019.8	62	48	55.2	+1.4	74	20	22	31	0	2	49	85	3.86	+.45	1.17	12	5	T	T	11.9	SE	--	---	--	12	8	11	5.2	--
Houston CO	41	1014.9	------	64	45	54.8	+2.1	79	18	19	31	0	4	--	--	3.55	-.15	1.62	11	3	T	T	11.7	---	36	NW	6	--	--	--	5.4	65
Houston	41	1017.6	1020.2	65	42	53.7	+1.4	81	18	19	31	0	5	43	75	5.37	+1.68	2.27	11	5	T	T	13.3	S	--	---	--	11	7	13	5.6	--
Laredo	500	1003.4	1018.2	71	45	57.9	+2.2	85	18	23	31	0	4	38	56	.08	-1.04	.04	4	1	T	T	10.6	SSE	--	---	--	--	--	--	4.8	--
Lubbock	3238	901.5	1017.8	53	22	37.5	-2.5	72	26	3	31	0	29	17	51	.32	-.17	.31	2	1	3.5	4	10.8	WSW	34	N	31	12	11	8	4.7	--
Palestine CO	491	1001.4	1019.6	59	39	48.8	+.6	77	19	15	31	0	9	--	--	3.16	-.28	2.28	4	6	2.1	2	9.4	---	26	W	14	12	7	12	5.3	57
Port Arthur CO	5	1018.3	------	63	46	54.5	+.7	75	23	21	31	0	4	--	--	5.14	+1.44	2.12	14	5	.6	1	14.6	---	37	NW	14	--	--	--	5.2	59
Port Arthur	5	1019.0	1019.5	64	42	53.1	----	78	18	22	31	0	7	46	85	5.36	-----	1.80	14	5	.8	T	11.8	SSE	--	---	--	11	16	14	5.6	--
San Angelo	1903	950.9	1019.0	60	31	45.2	-.7	80	19	10	29	0	19	19	41	.03	-.87	.02	2	0	.4	T	9.3	SSW	30	W	2	14	10	7	4.6	--
San Antonio	782	990.9	1019.3	65	36	50.5	-1.8	81	18	18	30	0	11	32	57	.25	-1.21	.12	4	2	.9	1	10.0	N	43	NW	2	--	--	--	4.8	55
Victoria	109	1015.2	1019.4	68	43	55.4	.0	83	18	20	30	0	4	41	68	1.66	-.81	1.21	7	1	T	1	10.5	SSE	51	NW	13	14	2	15	5.3	--
Waco	504	1000.3	1018.8	61	35	47.7	-.3	80	18	16	29	0	12	31	58	1.30	-.89	.83	6	5	.8	1	10.7	S	--	---	--	12	5	14	5.4	--
Wichita Falls	1027	981.4	1018.9	56	28	42.0	-.9	79	19	8	29	0	21	22	52	.35	-.77	.27	3	0	.6	1	13.1	N	29	N	6	--	--	--	5.2	--
UTAH																																
Milford	5029	846.6	1021.1	40	13	26.8	+.5	61	26	-24	31	0	30	18	70	.38	-.32	.22	3	0	10.0	7	10.6	S	--	---	--	6	7	18	6.6	--
Salt Lake City CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Salt Lake City	4222	872.0	1019.9	38	21	29.6	+2.1	53	15	3	31	0	29	21	74	1.69	+.71	.81	12	0	15.7	9	7.1	SSE	41	SE	18	6	7	18	7.1	37
VERMONT																																
Burlington	398	1001.7	1017.1	31	14	22.3	+3.5	52	21	-13	30	0	29	16	73	1.72	-.04	.61	16	0	12.6	8	11.9	SSW	40	NW	21	3	6	22	8.2	21
VIRGINIA																																
Cape Henry	16	1020.0	1020.7	54	36	44.7	+4.5	74	20	25	9	0	14	--	--	1.38	-1.77	.53	9	1	1.0	1	----	---	39	NW	8	8	15	8	5.4	61
Lynchburg	947	985.8	1020.5	48	28	37.8	+2.5	68	19	10	9	0	24	26	66	1.79	-1.64	.47	11	0	1.7	2	10.6	SSW	38	S	4	9	7	15	5.9	55
Norfolk CO	11	1017.3	------	55	37	45.5	+4.9	74	20	22	9	0	11	--	--	1.61	-1.49	.80	7	1	.8	1	----	---	29	NW	16	--	--	--	---	70
Norfolk	25	1020.0	1021.3	54	34	44.2	+6.0	74	20	22	9	0	14	33	67	1.68	-1.42	.75	7	1	.7	1	12.3	S	--	---	--	9	10	12	5.8	--
Richmond CO	162	------	------	52	31	42.4	+4.5	74	20	15	9	0	19	--	--	1.20	-2.01	.48	8	--	.1	T	----	---	--	---	--	--	--	--	---	--
Richmond	160	1015.2	1020.7	52	30	40.8	----	74	20	13	9	0	21	29	66	1.08	-----	.51	7	0	T	T	8.8	SSW	29	SW	3	10	6	15	6.3	59
Roanoke	1192	977.3	1020.6	49	28	38.5	+.7	69	20	15	9	0	23	26	64	1.03	-2.07	.26	9	0	.4	T	11.8	NW	--	---	--	6	10	15	6.5	--
Urbanna	31	1020.0	1020.9	53	32	42.4	----	74	20	14	9	0	17	--	--	2.18	-----	1.10	10	0	T	T	----	---	--	---	--	8	10	13	6.0	--
Washington CO	----	------	------	48	31	39.8	+6.4	71	20	18	9	0	20	--	--	2.42	-1.13	.77	10	0	.5	T	----	---	34	NW	21	--	--	--	---	55
Wash. Nat'l. AP	14	1016.3	1020.5	48	31	39.3	+5.9	71	19	18	9	0	20	26	61	2.18	-1.37	.71	10	0	.8	1	11.8	SSW	44	NW	21	6	8	17	6.9	49
WASHINGTON																																
Ellensburg	1727	953.9	1018.5	34	16	24.5	-1.0	46	1	-15	30	0	29	21	86	2.01	+.66	.66	14	0	23.4	14	6.4	WNW	--	---	--	5	3	23	8.0	--
Kelso	17	------	------	44	33	38.5	----	55	24	11	29	0	10	--	--	9.69	-----	1.89	23	0	T	T	----	---	--	---	--	3	3	25	8.3	--
North Head CO	194	1007.1	1014.9	46	36	41.3	-.8	53	15	21	28	0	5	--	--	10.88	+2.10	1.75	25	0	.9	T	18.2	---	78	W	2	3	5	23	8.3	23
Olympia	190	1008.5	1015.9	43	31	37.2	----	56	24	9	30	0	16	34	87	10.59	-----	1.69	23	0	.9	T	6.9	S	--	---	--	2	4	25	8.6	--
Port Angeles	11	1013.9	1015.1	44	36	39.9	----	60	24	20	27	0	5	34	80	5.30	-----	1.28	16	0	T	0	10.6	WSW	--	---	--	2	5	24	8.4	--
Seattle	14	1014.9	1016.1	--	--	----	----	--	--	--	--	--	--	33	78	-----	-----	----	--	--	----	--	10.6	S	--	---	--	--	--	--	---	--
Seattle CO	14	------	------	45	35	40.3	-.5	57	24	20	28	0	5	--	--	6.13	+1.19	1.34	19	0	T	T	13.1	---	63	SW	15	3	2	26	8.5	25
Spokane	2357	947.9	1017.9	33	22	27.1	-.4	46	15	-3	29	0	30	21	80	3.16	+1.00	.69	18	0	29.2	9	10.6	SSW	50	SW	15	5	5	21	7.5	29
Stampede Pass CO	3960	874.4	1016.7	26	18	22.0	----	41	24	-3	29	0	31	--	--	17.30	-----	3.58	25	0	121.6	122	13.1	---	61	E	28	3	0	28	8.9	--
Stevenson CO	319	------	------	41	32	36.7	----	54	24	15	29	0	13	--	--	16.38	-----	2.44	20	0	3.2	1	----	---	--	---	--	1	3	27	9.2	--
Tacoma CO	127	1009.1	1016.3	44	34	38.7	-.1	56	24	17	30	0	6	--	--	5.57	-.57	1.21	22	0	.6	T	10.6	---	52	S	15	4	5	22	8.0	29
Tatoosh CO	101	1010.5	1013.7	44	37	40.5	-.7	50	24	24	28	0	5	35	81	16.67	+4.84	3.19	23	0	.4	T	23.0	E	70	SW	16	3	3	25	8.5	23
Walla Walla	1200	------	------	--	--	----	----	--	--	--	--	--	--	27	--	-----	-----	----	--	--	----	--	----	SSE	--	---	--	--	--	--	---	--
Walla Walla CO	949	982.1	1019.0	41	30	35.5	+2.8	61	24	4	29	0	13	--	--	1.79	-.17	.64	13	0	1.5	1	6.8	---	42	SW	15	3	5	23	8.4	21
Yakima	1058	978.0	1018.3	38	19	28.4	+1.0	51	2	-7	30	0	31	22	79	1.87	+.96	.60	12	0	13.9	6	6.0	W	--	---	--	7	4	20	7.7	--
Seattle-Tacoma AP	379	1001.0	1015.7	42	32	37.0	----	54	24	11	30	0	16	31	80	6.80	-----	1.22	22	0	5.7	1	13.6	SSW	--	---	--	2	2	27	8.8	--
WEST VIRGINIA																																
Charleston	950	983.4	1019.8	49	29	38.8	----	74	20	11	9	0	23	28	69	5.18	-----	1.57	16	0	2.5	1	9.4	WSW	*45	WSW	20	3	5	23	8.1	--
Elkins	1969	948.5	1020.4	46	21	33.3	+3.3	70	20	2	9	0	27	26	76	3.98	+.20	1.33	16	0	7.5	2	6.6	WNW	50	W	21	3	6	22	8.4	37
Huntington	565	------	------	50	31	40.6	+9.9	72	20	11	9	0	18	--	--	5.85	+1.88	1.25	15	0	7.1	2	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	45	27	36.1	+3.6	71	20	8	9	0	24	--	--	5.81	+2.23	1.80	17	0	7.6	3	6.8	---	25	W	20	4	4	23	8.1	35
Parkersburg	837	------	1019.7	--	--	----	----	--	--	--	--	--	--	26	--	-----	-----	----	--	--	----	--	10.4	SSW	--	---	--	--	--	--	---	--
Petersburg	1013	981.4	------	48	24	36.0	----	72	20	5	9	0	25	--	--	2.57	-----	1.18	8	0	2.6	1	----	---	--	---	--	5	7	19	7.5	--
WISCONSIN																																
Green Bay	689	991.2	1018.5	21	2	11.6	-4.1	39	18	-31	30	0	31	3	68	.87	-.67	.24	10	0	12.2	15	10.6	SW	47	SW	1	7	8	16	6.5	49
La Crosse CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
La Crosse	669	993.2	1019.6	21	1	11.0	-3.3	45	18	-37	30	0	31	4	75	1.05	-.03	.38	8	0	14.5	15	8.7	NW	*35	NNW	20	--	--	--	7.1	--
Madison CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--
Madison	857	985.4	1019.1	24	4	13.7	-3.0	43	17	-37	30	0	31	7	76	1.44	+.06	.39	11	0	19.7	17	11.4	NW	33	N	20	--	--	--	7.3	45
Milwaukee	674	991.2	1018.1	26	11	18.6	-.8	43	17	-24	30	0	31	13	77	2.38	+.60	.52	12	0	27.1	22	12.2	WNW	39	S	22	6	4	21	7.5	38
Milwaukee CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	-----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	‡Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
WYOMING																																
Casper	5322	833.7	1017.5	31	10	20.5	-5.5	50	26	-23	28	[illegible]	30	[illegible]	61	.27	-.33	.09	7	0	6.2	3	15.5	SW	--	---	--	7	8	16	6.2	--
Cheyenne	6139	807.0	1018.1	33	12	22.6	-2.9	57	26	-27	31	0	30	7	53	.69	+.27	.36	[illegible]	0	9.6	[illegible]	15.6	W	54	W	21	7	8	16	6.5	55
Lander	5563	832.4	1019.0	33	[illegible]	20.5	+2.2	57	25	-20	29	0	31	6	56	.18	-.38	.06	6	0	3.2	2	7.6	---	59	SW	15	9	12	10	5.5	58
Rock Springs	6741	790.7	1021.1	27	8	17.8	+.4	44	25	-18	31	0	31	10	71	.58	+.13	.27	11	0	11.0	5	17.7	W	*51	W	14	2	16	13	6.9	--
Sheridan	3942	882.5	1019.6	32	7	19.5	+.2	54	15	-30	29	0	31	9	67	.55	-.30	.19	9	0	11.3	4	8.4	NW	50	NW	14	8	[illegible]	15	6.2	54
PACIFIC AREA																																
Canton Island	12	1008.5	1009.1	88	78	82.8	----	92	19	75	3	8	0	74	79	2.40	-----	1.99	11	0	.0	0	----	---	--	---	--	[illegible]	20	3	4.8	--
Hilo	26	1016.3	1017.6	78	63	70.8	----	84	21	60	25	0	0	64	82	9.33	-----	1.38	18	0	.0	0	5.2	SW	22	ENE	16	5	11	15	6.9	53
Honolulu CO	12	------	------	77	68	72.5	+1.6	80	4	62	26	0	0	--	--	1.75	-2.03	.77	12	0	.0	0	9.4	---	52	NE	14	15	11	5	4.0	78
Honolulu	7	1017.3	1018.0	79	67	73.0	----	82	3	60	26	0	0	63	74	1.21	-----	.50	8	0	.0	0	10.7	ENE	--	---	--	19	6	6	4.1	--
Lihue	115	1012.5	1017.6	77	65	70.9	----	80	29	55	24	0	0	64	80	3.02	-----	1.04	17	0	.0	0	10.7	W	--	---	--	6	17	8	5.7	54
Wake Island	11	1014.6	1014.9	81	73	77.0	----	83	9	69	29	0	0	70	78	2.16	-----	.67	16	0	.0	0	10.9	E	--	---	--	14	11	6	4.5	--
PUERTO RICO																																
San Juan	[illegible]	1013.9	1016.4	80	69	74.6	----	86	16	65	13	0	0	67	76	3.29	-----	1.25	17	0	.0	0	11.3	ESE	32	E	21	5	19	7	5.4	43
ALASKA												‡																				
Anchorage	134	1002.0	1007.1	14	-4	5.1	-6.5	37	1	-32	18	0	31	-1	66	.71	-.13	.29	7	0	12.2	18	5.0	NE	56	S	8	12	4	15	5.8	46
Annette Island	110	1005.3	1009.4	36	27	31.8	-2.4	45	7	15	27	0	25	25	75	8.56	-.85	1.53	20	0	18.8	[illegible]	13.2	ESE	--	---	--	3	3	25	8.5	--
Barrow	22	1021.0	1021.7	-20	-35	-27.8	-11.7	7	27	-53	15	0	31	-38	53	T	-.16	T	0	0	T	9	9.2	SE	29	SE	21	22	7	2	2.5	--
Bethel	21	1008.5	1010.2	4	-1	1.6	-5.5	38	28	-45	14	0	31	-8	77	.77	-.13	.42	[illegible]	0	8.0	10	8.9	N	*28	NNE	24	[illegible]	5	17	6.4	--
Cordova	40	1002.7	1004.4	25	[illegible]	17.0	-8.8	41	5	-18	15	0	28	15	84	6.55	-1.71	2.47	14	0	46.2	31	3.2	E	--	---	--	4	5	22	8.0	--
Fairbanks	436	997.6	1016.6	-17	-30	-23.2	-13.5	11	6	-54	19	0	31	-28	75	.57	-.41	.43	6	0	8.7	31	----	N	[illegible]	W	31	5	7	19	7.4	29
Galena	120	1011.2	1016.3	-16	-31	-23.9	-14.1	12	27	-64	15	0	31	-29	65	.81	+.14	.27	[illegible]	0	10.6	25	3.2	N	*35	ESE	26	15	3	13	5.0	--
Gambell	25	1015.9	1016.9	6	-5	.5	-3.6	30	28	-20	11	0	31	-4	82	.42	-.49	.32	4	0	4.2	5	22.4	NNE	50	N	7	14	3	14	5.3	--
Juneau	15	1009.7	1010.6	24	13	18.5	-6.7	40	6	-8	28	0	29	14	78	2.09	-1.97	.60	16	0	9.5	7	----	N	38	SE	12	3	2	26	8.4	27
Kotzebue	10	1017.8	1018.3	-11	-22	-16.4	-9.2	23	28	-40	17	0	31	-23	73	.25	-.24	.17	4	0	2.5	16	16.3	SSW	--	---	--	20	4	7	3.1	--
McGrath	334	1000.0	1013.9	-10	-24	-16.9	-10.2	17	2	-58	18	0	31	-19	80	.89	-.29	.28	13	0	27.6	26	2.4	NW	*25	NNW	13	10	4	17	6.3	--
Nome	13	1014.9	1015.6	1	-15	-6.7	-10.1	30	30	-31	12	0	31	-12	75	.13	-.96	.10	4	0	1.3	15	----	N	47	E	31	17	5	9	4.1	--
Northway	1713	949.9	1018.6	-20	-35	-27.4	-13.0	4	5	-56	15	0	31	-33	68	.13	-.47	.11	3	0	1.7	10	----	NW	--	---	--	7	3	21	6.9	--
St. Paul Island	22	1004.7	1005.8	28	20	24.3	.2	38	29	2	12	0	27	20	80	1.78	-.35	----	23	0	11.4	6	----	---	--	---	--	1	2	28	9.4	--
Umiat	337	1011.2	1029.8	-29	-45	-37.3	-19.3	13	26	-62	16	0	31	-41	70	.18	-.04	.05	7	0	1.8	16	6.4	W	--	---	--	Φ11	Φ3	Φ3	#3.2	--
Wales	[illegible]	1018.6	1019.3	-2	-14	-8.3	-8.6	19	23	-27	15	0	31	--	--	.04	-.71	.04	2	0	1.0	25	----	---	--	---	--	11	10	10	5.1	--
Yakutat	28	1005.1	1006.3	29	16	22.6	-5.8	40	6	-4	28	0	29	15	72	4.76	-6.80	1.35	17	0	44.9	23	9.4	E	*45	ESE	12	4	4	23	7.9	--

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
† Other dates also.
‡ Number of days Max. 70°F. or above for Alaskan Stations.
Φ Sun below horizon until January 15.
24 hr. average.

HEATING DEGREE DAYS

(Base 65°F)

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	557	1908	1647
Mobile (CO)	354	1142	1022
Mobile	359	1194	
Montgomery (CO)	424	1471	1332
Montgomery	459	1596	1332
ARIZONA			
Flagstaff	1121	3572	4055
Payson (CO)	770	1686	
Phoenix (CO)	370	610	970
Phoenix	399	697	
Prescott	849	2011	
Tucson	448	762	
Winslow	893	2286	
Yuma	273	387	746
ARKANSAS			
Ft. Smith	778	2198	2030
Little Rock	671	2035	1886
Texarkana	603	1706	
CALIFORNIA			
Bakersfield	522	1075	
Beaumont (CO)	554	1089	
Bishop	797	2050	
Blue Canyon	928	2643	
Burbank	367	691	
Eureka (CO)	552	2235	2638
Fresno	598	1288	1526
Los Angeles (CO)	298	518	656
Los Angeles	340	735	
Mt. Shasta (CO)	1012	3000	
Oakland	510	1315	
Red Bluff	647	1506	1647
Sacramento (CO)	579	1308	1625
Sacramento	602	1383	
Sandberg (CO)	751	1802	
San Diego	287	571	770
San Francisco (CO)	450	1541	1756
San Francisco	500	1408	
San Jose	460	1086	
Santa Catalina	381	872	
Santa Maria	434	1243	
COLORADO			
Alamosa	1351	4617	
Colorado Springs	1215	3434	
Denver	1175	3179	3297
Grand Junction	1220	3026	
Pueblo	1139	3103	3289
CONNECTICUT			
Bridgeport	988	2917	
Hartford	1046	3180	3408
New Haven	1011	3011	3227
DELAWARE			
Wilmington	948	2895	
DIST. OF COLUMBIA			
Washington (CO)	774	2407	2648
Washington	790	2416	
FLORIDA			
Apalachicola	318	947	801
Daytona Beach	220	707	
Fort Myers	125	370	
Jacksonville (CO)	244	871	765
Jacksonville	269	932	
Key West (CO)	31	52	37
Key West	32	61	
Melbourne	151	481	
Miami (CO)	85	213	109
Int. Airport, Hialeah	79	193	
Orlando	175	544	
Pensacola (CO)	292	1011	821
Tallahassee	362	1110	
Tampa	146	481	372
West Palm Beach	80	232	
GEORGIA			
Albany	598	1345	1074
Atlanta (CO)	620	1997	1836
Atlanta	602	1921	
Athens	649	1983	
Augusta	561	1753	1463
Columbus	498	1692	
Macon	471	1566	1488
Rome	696	2205	
Savannah	443	1382	1037
Valdosta	374	1220	
IDAHO			
Boise	1107	3075	3366
Lewiston	975	2864	
Pocatello	1271	3696	3888
ILLINOIS			
Cairo (CO)	837	2535	2401
Chicago (CO)	1196	3549	3484
Chicago	1283	3907	
Chicago University	1218	3691	
Joliet	1308	4138	
Moline	1372	4050	
Peoria	1254	3816	3537
Springfield (CO)	1100	3380	3225
Springfield	1142	3607	
INDIANA			
Evansville	969	2984	2627
Ft. Wayne	1161	3806	3554
Indianapolis (CO)	1048	3296	3162
Indianapolis	1105	3532	
South Bend	1209	3886	
Terre Haute	1080	3491	
IOWA			
Burlington	1315	3946	
Charles City (CO)	1670	4770	4479
Davenport (CO)	1346	3880	3658
Des Moines	1380	3999	3862
Dubuque	1483	4205	3977
Keokuk (CO)	1235	3606	3326
Sioux City	1480	4237	4063
KANSAS			
Concordia (CO)	1163	3167	3234
Dodge City	1117	2973	3023
Goodland	1201	3366	
Topeka (CO)	1072	2976	3044
Topeka	1109	3139	
Wichita	1010	2756	2802
KENTUCKY			
Lexington	926	3003	2791
Louisville (CO)	881	2749	2614
Louisville	900	2854	
Pikeville (CO)	749	2414	
LOUISIANA			
Baton Rouge	365	1126	989
Lake Charles	378	1020	
New Orleans (CO)	236	813	795
New Orleans	262	933	
Int. Airport, Moisant	298	949	
Shreveport	513	1471	1387
MAINE			
Caribou	1589	5097	
Eastport	1176	3932	4518
Greenville (CO)	1521	4936	5241
Portland	1220	3882	4009
MARYLAND			
Baltimore (CO)	806	2405	2563
Baltimore	862	2700	
Frederick	921	2860	
MASSACHUSETTS			
Boston	953	2804	3221
Milton	1060	3370	
Nantucket	898	2773	2936
Pittsfield	1229	4084	
MICHIGAN			
Alpena (CO)	1383	4415	4415
Detroit	1148	3630	3624
Escanaba (CO)	1506	4939	4721
Grand Rapids (CO)	1197	3702	3726
Grand Rapids	1252	3993	
Iron Mountain	1579	5211	
Lansing	1250	4043	
Marquette (CO)	1455	4924	4695
Muskegon	1242	3983	
Sault Ste. Marie	1563	5264	5018
Traverse City	1356	4360	
Ypsilanti	1169	3750	
MINNESOTA			
Duluth (CO)	1804	5901	5419
Duluth	1855	6150	
International Falls	2025	6567	
Minneapolis	1721	4973	4623
Rochester	1781	5151	
St. Cloud	1892	5603	5107
St. Paul	1732	4962	
MISSISSIPPI			
Jackson	486	1532	1396
Meridian	500	1642	1491
Vicksburg	477	1482	1334
MISSOURI			
Columbia	1053	3215	3028
Kansas City	1057	2988	2960
St. Joseph	1158	3308	
St. Louis (CO)	981	2967	2735
St. Louis	996	3064	
Springfield	964	2900	2723
MONTANA			
Billings	1376	4142	4212
Butte	1698	5686	
Glasgow (CO)	1811	5439	
Great Falls	1449	4341	
Havre (CO)	1672	4978	4868
Helena	1487	4348	4539
Kalispell	1423	4604	4678
Missoula	1424	4561	4491
NEBRASKA			
Grand Island	1346	3764	
Lincoln (CO)	1300	3584	3534
Lincoln	1354	3778	
Norfolk	1417	4073	
North Platte	1251	3683	3743
Omaha	1380	3807	3606
Valentine (CO)	1398	4118	4145
NEVADA			
Elko	1253	3709	
Ely	1221	3756	
Las Vegas	650	1322	1726
Reno	980	2948	3236
Tonopah	1044	3427	3303
Winnemucca	1050	3183	3734
NEW HAMPSHIRE			
Concord	1229	3830	4149
Mt. Washington Obs.	1746	7414	
NEW JERSEY			
Atlantic City	822	2409	2648
Newark	910	2748	3065
Trenton	902	2760	2965
NEW MEXICO			
Albuquerque	874	2113	2799
Clayton	1060	2771	
Roswell	820	2000	2283
Raton	1214	3316	
NEW YORK			
Albany	1204	3748	3714
Bear Mountain (CO)	1097	3536	
Binghamton (CO)	1093	3605	3788
Binghamton	1135	3861	
Buffalo	1124	3581	3659
New York (CO)	877	2581	2889
La Guardia Field	862	2541	
Oswego	1146	3602	
Rochester	1158	3650	3692
Schenectady (CO)	1198	3642	
Syracuse	1182	3720	3790
NORTH CAROLINA			
Asheville (CO)	807	2592	2515
Asheville	848	2783	
Charlotte (CO)	662	2019	1970
Charlotte	698	2137	
Greensboro	777	2464	
Hatteras (CO)	504	1450	1405
Raleigh (CO)	642	2013	1969
Raleigh	671	2169	
Wilmington (CO)	485	1574	1452
Winston-Salem	756	2367	
NORTH DAKOTA			
Bismarck	1925	5668	5185
Devils Lake (CO)	2029	6236	5868
Fargo	1981	6870	
Grand Forks	2015	6067	5765
Williston (CO)	1835	5632	5393
OHIO			
Akron	1135	3816	
Cincinnati (CO)	902	2847	2909
Cincinnati	994	3240	
Cleveland (CO)	1061	3324	3340
Cleveland	1080	3482	
Columbus (CO)	1003	3241	3160
Columbus	1035	3448	
Dayton	1093	3553	3119
Sandusky (CO)	1068	3370	3357
Toledo	1146	3723	3492
Youngstown	1116	3764	
OKLAHOMA			
Oklahoma City (CO)	776	2127	2268
Oklahoma City	803	2176	
Tulsa	808	2269	
OREGON			
Baker (CO)	1224	3688	4150
Baker	1290	3932	
Burns (CO)	1265	3744	
Eugene	749	2323	
Meacham	1267	4051	
Medford	799	2402	2774
Pendleton	966	2935	
Portland (CO)	757	2249	2491
Portland	776	2435	
Roseburg (CO)	699	2001	2466
Salem	774	2413	
Sexton Summit (CO)	1012	3238	
Troutdale	795	2513	
PENNSYLVANIA			
Allentown	1041	3262	
Curwensville	1184	4254	
Erie (CO)	1046	3296	3393
Harrisburg	973	3088	3088
Park Place	1155	3845	
Philadelphia (CO)	848	2518	2663
Philadelphia	890	2652	
Pittsburgh (CO)	911	3011	3025
Pittsburgh	989	3294	3253
Reading (CO)	911	2829	2977
Scranton (CO)	1037	3312	3498
Williamsport	1089	3495	3450
RHODE ISLAND			
Block Island	901	2630	2958
Providence (CO)	929	2794	3275
Providence	978	2991	
SOUTH CAROLINA			
Charleston (CO)	431	1351	1153
Charleston	485	1506	
Columbia (CO)	544	1688	1556
Columbia	585	1822	
Florence	558	1770	
Greenville	697	2096	1885
Spartanburg	723	2137	
SOUTH DAKOTA			
Huron	1671	4893	4634
Pierre	1474	4306	4253
Rapid City	1367	4120	4030
Sioux Falls	1607	4714	
TENNESSEE			
Bristol	809	2731	
Chattanooga	695	2206	1997
Knoxville	708	2367	2237
Memphis	682	2140	1913
Nashville	763	2472	2195
TEXAS			
Abilene	632	1628	1660
Amarillo	923	2342	2529
Austin	433	1036	1128
Big Spring	681	1626	
Brownsville	173	394	440
Corpus Christi	269	578	650
Dallas	572	1495	1543
Del Rio (CO)	407	963	1066
El Paso	634	1413	1690
Ft. Worth	583	1500	1508
Galveston (CO)	295	684	761
Galveston	300	711	
Houston (CO)	327	777	
Houston	358	872	880
Laredo	246	559	
Lubbock	844	2153	
Palestine (CO)	495	1268	1340
Port Arthur (CO)	325	848	908
Port Arthur	369	992	
San Angelo	606	1459	
San Antonio	443	1044	959
Victoria	311	716	
Wichita Falls	706	1867	
Waco	531	1332	
UTAH			
Milford	1181	3311	
Salt Lake City (CO)	1045	2877	3298
Salt Lake City	1092	3064	3542
VERMONT			
Burlington	1316	4079	4463
VIRGINIA			
Cape Henry	621	1892	1937
Lynchburg	835	2613	2419
Norfolk (CO)	596	1834	1910
Norfolk	638	2009	
Richmond (CO)	722	2263	2304
Richmond	719	2335	
Roanoke	817	2641	
Urbanna	692	2212	
WASHINGTON			
Ellensburg	1247	3920	
Kelso	815	2739	
North Head (CO)	731	2879	2915
Olympia	853	2955	
Port Angeles	773	3296	
Seattle (CO)	758	2378	2688
Seattle	866	2934	
Spokane	1168	3733	3738
Stampede Pass (CO)	1329	5062	
Stevenson (CO)	869	2748	
Tacoma (CO)	810	2623	
Tatoosh Island (CO)	753	3278	3246
Walla Walla (CO)	905	2701	2973
Yakima	1127	3497	3497
WEST VIRGINIA			
Elkins	975	3503	3314
Huntington	749	2515	
Parkersburg (CO)	889	2939	2870
Petersburg	894	3060	
Charleston	803	2674	
WISCONSIN			
Green Bay	1651	5112	4439
La Crosse (CO)	1591	4511	4335
La Crosse	1670	4875	
Madison (CO)	1528	4464	4229
Madison	1585	4641	
Milwaukee (CO)	1375	4122	3883
Milwaukee	1434	4351	
WYOMING			
Casper	1374	4111	
Cheyenne	1308	3995	4131
Lander	1375	4252	4806
Rock Springs (CO)	1328	4020	
Rock Springs	1458	4391	
Sheridan	1409	4261	
ALASKA			
Anchorage	1855	6998	
Annette Island	1022	4206	
Barrow	2882	10592	
Bethel	2124	7336	
Cordova	1480	6036	
Fairbanks	2743	9130	
Galena	2760	8780	
Gambell	2000	7323	
Juneau	1423	5635	
Kotzebue	2528	8311	
McGrath	2544	8634	
Nome	2226	7365	
Northway	2874	9923	
St. Paul	1262	5755	
Yakutat	1305	5500	
Umiat	3178	10600	
Wales	2276	7740	

Data from airport unless otherwise specified. CO indicates data from city office.

SEVERE STORMS

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Iowa, southern and eastern portions	2	Morning			2	12	$5,000		Ice (freezing rain), sleet, and snow	Especially heavy accumulations of glaze and ice in Davenport-Moline area. Icing conditions made driving hazardous. Ice-covered pavement was contributing factor in two deaths, one in Scott County and one in Cedar County. Glaze of 1/8 to 3/16 inch on telephone wires caused only minor breaks; interruption in service was at a minimum.
Washington, western portion	2	10 a.m. - midnight				2	50,000		Wind	Southwest to west gale winds covered much of State, but with destruction reported west of Cascade Mountains only, and there largely on immediate Pacific Coast and inland along Puget Sound south to Columbia River. Extreme speeds in miles per hour reported as follows: North Head Weather Bureau, 78 from west; Seattle Weather Bureau City Office, 58 from southwest. Damage largely to communication and power lines, trees, plate-glass windows, dock facilities and small boats. Estimated damage at Longview $10,000, with several thousands additional at Port Angeles, Seattle, and other points on inland waters, and considerable sporadic, unestimated damage over larger area.
Beaumont, Jefferson County, Tex.	2	8:30 p.m.					500		do	Leveled a wood and sheet metal lumber storage building
Oregon, along Columbia River and adjacent areas and in Baker area.	2-3	Late evening of 2d and early morning of 3d	†Several-			1	50,000		do	Wind speeds of 45 to 65 m.p.h. observed at Baker Airport. Baker Weather Bureau Office recorded fastest speed of 42 m.p.h. Destruction largely in Moro and Baker areas; however, minor damages caused to power lines and outdoor signs in several areas along Columbia River and in northeastern Oregon. At Moro a large warehouse blown down, resulting in $12,000 loss. In City of Baker many power and telephone lines damaged, numerous outdoor signs partially or totally destroyed, roofs blown off, and quite a number of windows broken. Several trees blown over. An estimated $25,000 damage caused in this area alone. No serious losses to crops or livestock.
Wisconsin, southern half	2-3					See remarks	10,000		Ice (glaze) and snow	Highway traffic badly disrupted because of freezing rain followed by snow. Inter-city bus service halted due to road conditions. A number of autos damaged because of collisions or skidding. Several persons injured by falling on slippery walks and streets.
Denver, Colo.	3	10:45 a.m. - 2:15 p.m.	†20	20		1	4,000		Wind	Wind varying in intensity from fresh to gale force prevailed in Denver and vicinity, with peak speed of 43 m.p.h. at 1 p.m. Trees broken and uprooted, and nearby automobiles damaged. A woman suffered fractured hip when wind caught door of telephone building, as she was leaving the structure.
Wallace and vicinity, Idaho	3						See remarks		Snow	Reports indicate "heavy" damage to power lines.
Alexandria-Pineville, La.	6	5:30 p.m.	300	15	0	11	175,000	0	Tornado	High winds extended outward several miles from tornado. Developed on squall line and moved almost due northward to vicinity of Pollock, La. Two homes and 4 stores destroyed, while 42 homes and 11 other buildings damaged. Fifty families directly affected by tornado. Center passed over business district of Alexandria, and brick front of a store hurtled down on parked automobiles.
Jefferson County, Ky.	6-7				3	4			Snow	Three inches of snow caused streets to become slippery and dangerous. Several accidents reported. Deaths and injuries indirectly due to storm.
New England, entire section	7-8	Early morning of 7th to forenoon 8th			4	See remarks			do	First general substantial snowstorm, 4 to 9 inch accumulation, except near south coast. Hazardous highway conditions caused many skidding accidents which hospitalized uncounted numbers of persons.
Pennsylvania, most of State	7-8				1	6			Snow and ice (glaze)	Mixed rain and snow in southeastern sections and snow in mountains and western portion, with slowly falling temperatures, created slippery highways that resulted in frequent accidents. One person killed in Lancaster County and six injured near Greencastle.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Los Altos - Sunnyvale district, Santa Clara County, Calif.	11	8:25 - 8:30 a.m.	1000	3 to 4	0	0	$1,500,000	0	Tornado	First struck Los Altos residential area, then skipped about 3 miles and came down in an orchard near El Camino Real and proceeded through a portion of Sunnyvale business district. Southern Pacific Railroad Depot at Sunnyvale and plants of Westinghouse and Woolridge hard hit by storm. No evidence to indicate that storm reached as far east as Bayshore Highway. Throughout path of storm, flimsy buildings demolished; other buildings sustained lesser damage, such as windows blown out or roofs blown off, etc; some orchard trees uprooted or twisted off above ground; many ornamental and shade trees twisted off or uprooted; power lines broken; some power poles downed or snapped; television antennae twisted and snapped; some automobiles damaged; some houses shifted on their foundations in a counterclockwise direction. This storm was associated with a very severe cold front over northern California moving southeastward. Gusts at San Francisco Airport reached 78 m.p.h. at 7:43 a.m. on 11th (wind shift occurred at same time). At Moffett Field wind shift occurred at 8:12 a.m.
San Jose district, Santa Clara County, Calif.	11	8:45 a.m.	100	2 to 3	0	0	50,000	0	do	Losses due to this storm included havoc wrecked on homes and business properties as tornado struck in vicinity of Delmas Avenue and West San Fernando Street and continued in an eastward direction, passing near City Hall, and finally dissipated near eastern foothills. Roofs ripped off homes; trees forced down; structures and other property also damaged.
Torrance district, Los Angeles County, Calif.	11	3:40 - 3:50 p.m.	25	2			100,000		Winds (possibly tornadic)	Area damaged was in Torrance, near 236th Street, and mostly between Pennsylvania and Vermont Avenues. Several persons narrowly escaped death when oil well derricks toppled on an occupied home and automobile. A total of about 15 wooden structure oil well dericks blown down and completely demolished. One derrick fell across power lines and caught fire; also, caused shorting of power lines which blew fuses and damaged radio and television sets in immediate vicinity. Storm path estimated at 25 yards in width and length of damage area was about 2 miles in a nearly straight east-west line. Storm apparently traveled at an average height of about 500 feet above ground, although roofs were lifted from about 3 buildings on open flat ground. The oil well derricks were on a slight ridge. All towers fell toward the east, with one exception, and this fell toward the north-northeast, probably due to guy wires or variance in strength of tower structure. Witnesses said storm had a circular motion. No funnel-shaped cloud observed. Moderate rain falling at time of wind damage. Strong westerly winds prevailed over entire area all afternoon.
Kentucky	13-14								Rain	Numerous roads closed because of high water due to heavy rain. About 25 families in Hopkinsville had to be moved from their homes as a result of flooding caused by 4 1/2 inches of rain in 18 hours. Some streets in Louisville flooded.
Baltimore, Md.	14	P.m.				1			Ice (glaze)	Stalled and wrecked motor vehicles lined Baltimore streets and roads leading into city after a light rain froze and formed a thin sheet of ice on pavements. On a 12-mile stretch of Pulaski Highway from city line to near White March more than 30 trucks and automobiles ditched. Ritchie Highway likewise was cluttered with stalled vehicles, many with smashed fenders and bumpers. City police reported minor accidents, but apparently only one person seriously injured.
Michigan, southern portion	14				3	15	3,000		Ice	Glazed roads caused injuries and deaths.
Oregon, along coast and across northern half of State	14-15	Most of 14th and morning of 15th	†100				150,000		Wind	Winds at height of storm averaged 40 to 55 m.p.h., with gusts up to 65 and 70 m.p.h. Damage to buildings, power lines, outdoor signs, trees, roofs, and windows. No significant loss of livestock or crops.
Tyler, Pleasants, Wood, Jackson, Mason, Ritchie, Wirt, and Roane Counties, W.Va.	14-15						See remarks		Rain	Heavy rains, averaging about 2 inches, caused local flash floods in smaller streams which resulted in minor landslides and briefly inundated highways. In lower sections of Parkersburg water, backing up from overtaxed sewers, flooded some basements.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Town of Lahaina and vicinity, Island of Maui, Hawaii	14-15					1	$250,000	See remarks	Wind	Church demolished. National Guard Armory heavily damaged. Damage included 62 residences and 6 business establishments. About 8,000 acres of growing cane adversely affected. Said to have been worst storm in area for 30 years.
Idaho, northern portion	15				1		See remarks		do	Man killed by falling tree at Coeur d'Alene. Trees blown down at numerous places, blocking roads and damaging power and telephone lines, particularly in vicinity of Wallace.
Washington, entire State	15-16	2 a.m. to near midnight				6	400,000		do	Gale winds, mostly from southwest, in storm of marine origin, covered all parts of State. Principal damage in western inland waters and along Pacific Coast. Extreme speeds in miles per hour were as follows: - 63 at Seattle City, 73 at North Head Weather Bureau, and 50 at Spokane Weather Bureau. In western area, extensive damage to electric and communication lines, many trees blown down; occasional damage to structures, including wharves and bulkheads, barges, and small boats. Two small airplanes destroyed and two damaged at Boeing Airport, Seattle. Damage in eastern Washington was sporadic and relatively light, although Spokane damage placed at several thousand dollars, alone. Eastern counties' loss, included in totals, will probably not exceed $50,000.
Port Angeles and vicinity, Wash.	20	11:30 a.m. -9:30 p.m.				2			Wind and snow	Strong east winds, accompanying snowstorm, with gusts to 43 m.p.h. at Weather Bureau. Storm damage localized to area from Port Angeles to a distance of 30 miles east, but not reaching Port Townsend. Considerable disruption of communication lines and interruption of highway travel. Traffic accident on highway near area, due to storm, injured two men severely.
Fort Wayne Airport, Ind.	20	3:10 p.m.	†1			1	9,000		Wind	Six aircraft damaged.
Wisconsin, eastern and southeastern portions	20	Day				See remarks	15,000		Snow and wind	Freezing drizzle followed by several inches of snow and considerable drifting due to strong winds temporarily halted highway travel in some parts of eastern and southeastern Wisconsin. Several persons injured in accidents attributed to storm. More than 100 autos suffered damage in traffic accidents, due to road conditions and reduced visibility.
Florence and Colleton Counties, S.C.	20-21	Day and night						$18,000	Forest fires	Spread by dry, windy weather.
Great Falls, Mont.	21	Morning							Wind	Sudden gust of wind toppled a false store front upon two parked cars.
Port Angeles, Wash.	27-28	3:30 p.m. 27th - 11:30p.m. 28th					10,000		do	Strong, long-continued northeast winds with gusts above 35 m.p.h. sank a 35-foot work boat and damaged docks at Port Angeles, with considerable lumber loss.
Indiana, central and southern portions	28								Ice (glaze)	Roads and walks icy. Exposed objects ice-coated.
Massachusetts, Rhode Island, and Connecticut	28-29	6:p.m. 28th to early afternoon 29th			3	See remarks			do	Freezing rain coated all exposed surfaces, wires, trees, and roads with 1/2 to 1 inch of ice, producing extremely dangerous conditions for vehicular and pedestrian travel. Scores of minor accidents. Some wire damage. Uncounted numbers of persons hospitalized.
Pennsylvania, most of State	28-29				6	600			do	Ice-coated streets and highways in western counties caused the deaths and injuries, with 270 injuries treated by Pittsburgh Hospitals. Highway travel nearly at a standstill in many sections, due to thick coating of glaze.
Texas, Louisiana, and Mississippi	Jan.29 - Feb.2								Ice(glaze), rain, sleet, and snow	These reports will be published in the February "Severe Storm Data".
Maryland, east of Washington County	30-31	All day				1			Snow and ice	Autos and trucks skidded dangerously, and traffic was snarled in many parts of Baltimore and the State, as roads became sheathed in ice under the influence of a driving snowstorm. Literally hundreds of automobiles stalled along roads for hours. Street car schedules delayed as much as 3 hours on some lines in city. Man injured rather seriously when he stumbled over a wooden platform the was covered with snow.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Virginia, central and southwestern portions	30-31					See remarks			Ice (glaze)	Transportation of all kinds slowed, and in some instances at standstill. Schools in Amherst, Appomattox, Bedford, and Campbell Counties closed for 2 days because of lack of transportation. Numerous automobile accidents. Many minor injuries.
New England, entire section	31	5 a.m.				See remarks			Snow and ice (freezing rain)	A 1- to 4-inch snowfall on already iced surfaces was further aggravated by freezing rain, as temperatures fell rapidly to near or below zero. Skidding collisions and slippery sidewalks hospitalized uncounted numbers of people.
Kentucky	31					2			Sleet and snow	Two to 6 inches of snow and sleet covered all of Kentucky. All roads slick and hazardous and many closed. Transportation in many areas halted. Schools in most areas forced to close.
Tennessee, western and middle portions, especially in Nashville area	Jan. 31 and Feb. 1	All day 31st to afternoon of 1st					See remarks		Rain, ice, (freezing rain), sleet and snow	It is believed that never before in recorded history did winter hit this area with such a devastating force. Complex transportation systems of area held immovable for a period of 2 days. An estimate of 16,000 homes without electricity in Nashville area alone. Approximately 2,500 telephones out of order. Property damage ran to an unestimated millions of dollars. Damage suffered by Western Union Telegraph and Telephone Co., in Tennessee, $100,000; Nashville Electric Service, $350,000; Southern Bell Telephone and Telegraph Co., in Tennessee, $1,000,000. Over 2,500 poles and 2,200 cross arms required replacement, and over 16,000 miles of wire of all kinds had to be reinstalled. Southern Coach Lines operating in Nashville estimated property damage at $100,000. Damage to city and county streets, roads, and highways estimated at $500,000. Loss of revenue by business which was at a complete standstill for 3 days will easily exceed one million dollars. (Survey by Southern Bell Telephone Co. of all other affected cities and towns in 5-State area which extended from Louisiana, north-central Mississippi, northwestern Alabama, western and middle Tennessee and approximately the entire State of Kentucky estimated the damage to its property from five to six million dollars.)

PRELIMINARY TOTALS BY STORM TYPES FOR JANUARY 1951

Type	Deaths	Injuries	Damage
Tornado		11	$1,725,000
Wind	1	12	1,023,000
Ice and freezing rain	15	636	1,568,000
Snow	7	7	515,000
Forest Fires			18,000
Total	23	666	$4,849,000

† Miles instead of yards.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS
JANUARY 1951

Floods during January were mostly minor with no serious damages being reported in any of the drainage areas. This is quite a contrast to January 1950 when serious floods with record to near record stages were reported in several river systems of the country.

The most important flooding this month was in the Ohio Basin and along the Pacific coast where the Eel River reached its highest crest since 1943 at Fernbridge, Calif. It was the fourth consecutive month with light to moderate flooding in many streams in the Columbia Basin in northwest Oregon and southwest Washington.

ST. LAWRENCE DRAINAGE.--Minor flooding occurred in the Lake Michigan drainage along the Red Cedar River at East Lansing, Mich., between the 4th and 6th due to heavy rain on the 2d and 3d averaging 1.3 inches. No damage was reported.

Ice jams caused minor overflow along the Grand River in the suburban sections of Grand Rapids, Mich., on the 7th and 8th below Pearl Street gage.

Minor flooding occurred between the 2d and 8th in the Lake Erie drainage in the Maumee River and tributaries from rains on the 2d and 3d and snow melt. The Chagrin River topped bank-full stage at Willoughby Dam, Ohio, by 1 foot on the 4th due to moderate rains and snow melt.

ATLANTIC SLOPE DRAINAGE.--Snow surveys at the end of the month in the Merrimack River Basin showed the water content of the snow cover above Concord, N. H., to average about 2 inches. This is about 50 percent of normal for January.

There was some flooding in the headwaters of the Chenango River at Sherburne, N. Y., and in the Susquehanna at Oneonta, N. Y., on the 4th due to moderately heavy rains on the 3d and 4th. No damage resulted.

EAST GULF OF MEXICO DRAINAGE.--Some flooding resulted along the Tombigbee River from the heavy rain on the 3d and 4th. Rainfall in the extreme upper portion of the basin averaged around 4 inches. Additional rainfall later in the month prolonged the period of high water. No serious overflows occurred at any of the stations and no damage resulted.

Heavy showers on the 1st, 2d and 3d over the headwaters of the Pearl River produced sharp rises to above flood stage at Jackson, Miss., on the 7th and to near flood stage over headwater areas above Jackson. Damage was negligible.

MISSOURI BASIN.--Ice freezing in the Beaverhead River near Dillon, Mont., forced the river out of its banks in the surrounding lowlands. Several families had to leave their homes due to rising waters. Damages were light. A similar flood due to ice occurred in this area in 1937.

OHIO BASIN.--Precipitation was above normal over most of the basin during January and occurred rather frequently as rain, freezing rain, sleet and snow. There was some runoff from snow melt during periods of mild temperatures.

Two pronounced rises occurred in most streams in the Ohio Basin during the month. A third rise developed towards the end of the month which continued into February.

The first rise occurred between Jan. 2-4 from rain averaging 3 to 3.5 inches over the lower Cumberland and Green Basins. In the central portion of the Ohio Basin the rainfall averaged 2.5 inches and over the northern tributary headwaters and the upper Ohio Basin it averaged 1 inch or less. Light to moderate flooding resulted in several tributary streams. Mild weather also caused considerable snow melt and helped to produce slight flooding in the headwaters and near the mouth of the Allegheny River. Several ice jams formed as the mild temperatures and the rise in the river broke up the ice sheet of 3-4 inches in the upper and middle reaches of the Allegheny River. The Ohio River rose sharply but crests were well below flood stage, except at Midland, Pa., and Dam 50.

The second rise resulted from heavy rainfall between Jan. 13-15. Storm totals up to 4.5 inches were reported over the lower Ohio Basin; over the middle reaches and the upper portion of the basin, storm totals between 2 and 2.5 inches were reported, except in the upper half of the northern tributaries where amounts were generally less than an inch. Light to moderate flooding resulted in several tributaries. The rise on the Ohio River was more pronounced than during the first rise. Flooding, however, was confined to the lower portion with the river rising to a stage of 11 feet above flood stage at Dam 50.

Beginning on the 30th another period of rainfall, combined with considerable freezing rain, produced storm totals exceeding 3.5 inches over the southern portion of the basin, resulting in floods or rather high stages on all southern tributaries and near flood conditions in the middle and lower main stem of the Ohio River.

No serious damage resulted from the flooding. There was some damage to corn in the fields. Damage to highways and bridges was minor.

WHITE AND RED BASINS.--Moderate to heavy rains on the 11th, 12th and 13th caused generally light flooding along the White,Black and Little Red Rivers in the White Basin during the last half of the month and along the Ouachita and Little Missouri Rivers in the Red Basin between the 14th and 24th. The rainfall averaged 2 to 2.5 inches in the White Basin and 2.5 to 3 inches over the Red Basin.

LOWER MISSISSIPPI BASIN.--There were two significant rises in the St. Francis River Basin during January. The first resulted from rainfall on the 3d which averaged about 2 inches in the lower half and 1 inch in the upper half. The river reached near bank-full stage at Fisk, Mo., and St. Francis, Ark., but no flooding occurred. The second rise resulted from rainfall between the 13th and 15th which averaged about 2 inches in the upper portion. In the middle portion rainfall totals up to nearly 4 inches were reported. Minor flooding resulted but there were no damages.

Rather intense rainfall with amounts of 4-5 inches occurred over the Coldwater and Tallahatchie River Basins in Mississippi on the 1st and 2d. The rain produced sharp rises in the rivers with the Coldwater at Sarah, Miss., exceeding bank-full stage on the 3d and the Tallahatchie at Swan Lake on the 5th. A 5-day rainy period between the 10th and 14th produced general rains over the Tallahatchie-Yazoo Basin with amounts ranging from around an inch over the southern portion at Yazoo City to as much as 4 inches in the northern portion. These rains were instrumental in maintaining above flood stage readings at Swan Lake through the rest of the month and the Coldwater to exceed flood stage again between the 13th and 16th. The Yazoo River rose to above flood stage on the 22d and was still rising on the 31st.

ATCHAFALAYA BASIN.--Frequent heavy rains over the Ohio Basin during the first half of the month caused a gradual rise along the Atchafalaya to above flood stage at Atchafalaya, La., on the 22d. No damage resulted from the light overflow.

CALIFORNIA COAST DRAINAGE.--During the last half of December 1950 and the first nine days of January 1951, precipitation in the Central Valleys of California was light. Temperatures continued to be above normal at most stations and by the 9th, only 7 inches of snow was on the ground at Norden, Calif., in the Central Sierras as compared to a normal of 51 inches. On the 10th the pressure systems of the eastern Pacific Ocean had developed into a westerly weather type and a series of cold fronts brought moderate to heavy precipitation at all levels in northern and central California during the next two weeks. Precipitation from the 24th of the month to the 31st was again light and widely scattered. The monthly precipitation for Sacramento, Calif., was actually 1.27 inches below the normal for January.

Precipitation that began as rain to high levels on the 9th turned to snow above 3,500 feet on the 11th. The runoff was therefore limited but sharp moderate rises were experienced on all tributary rivers and streams in the Central Valleys. Some minor flooding occurred on some of the Valley creeks and streams but with very little damage or inconvenience. A moderate crest on the Sacramento River resulted in about one-half foot overflow on the Tisdale Weir into the Sutter Bypass.

On Jan. 17 moderate to heavy rain to high levels again began to fall over the Central Valleys resulting in new rises on all rivers and streams. This rise caused flow over the Tisdale Weir again and over the Fremont Weir into the Yolo Bypass. Following the frontal passage, which had been nearly stationary across northern California on the 17th, another front brought heavy rain on the 21st and 22d. The 24-hourly precipitation during the height of the storm averaged 6 to 8 percent of the seasonal normal in the Sierra Nevada Range and at least 8 percent of the normal in the Coastal Range. The peak flow on the Sacramento River resulted in near danger stages in the Knights Landing area and flow over all of the weirs on the river. The depth of the flow over the weirs averaged 3 to 4 feet. Flow over the Tisdale Weir continued until the 29th and over the Fremont Weir into the Yolo Bypass until the 31st. The county road between Sacramento and Woodland was closed during this period. The flow in the Yolo Bypass reached near the danger level but no new flooding occurred. While the rise on the American River caused widespread concern, the levees had been plugged and no flow over or through the old breaks occurred.

Minor flooding occurred in the upper reaches of the Russian River on the 21st and 22d from rainfall averaging 2.1 inches on the 21st. In the headwaters the rainfall totalled nearly 5 inches. The river at Hopland, Calif., rose rapidly from a stage of 9 feet on the morning of the 21st to a crest of 25.6 feet at 9:20 p.m. Except at Hopland, January stages did not equal those of the storm of Dec. 3-5, 1950, and little new damage resulted. Near and above Hopland the new flood was much higher than that of December and there was again some erosion of river banks and deposit of silt. Near Calpella a few houses and a sawmill were inundated.

Heavy rain (5 inches) on the 21st caused the Eel River to rise to a crest of 23.3 feet at Fernbridge, Calif., by 10:30 a.m. on the 22d. Flood stage was exceeded by 4 p.m. on the 21st. The crest at this point was the highest since 1943. Many thousands of acres of farm and dairyland were under water at the height of the flood. Damages were light.

COLUMBIA BASIN.--January was the fourth consecutive month with slight to moderate flooding in many streams of northwest Oregon and southwest Washington, and moderately high stages in most other rivers where bank-full stages did not occur. The principal freshet occurred during the period from the 17th to the 20th but there were several other small floods of lesser importance. There were five distinct and separate times when minor flooding occurred in the Santiam at Jefferson, Oreg.

Mean river levels for January this year have been generally higher than those for several years. Usually the high monthly average stages were caused by one distinctly high flood. Freshets this year have been the result of generally wet weather since the fall rains began last October. January 1951 was the wettest at Portland, Oreg., since 1914. It is believed that this condition is generally reflected at most river and climatological stations in northwestern Oregon. Rainfall in southwestern Washington, a few miles north of Portland, was not as heavy as at Portland. The reverse is generally true. The flood of the 17th to the 20th was the result of just moderate rains accompanied by mild temperatures and some snow melt in both the coast range and Cascade Mountains west of the Divide.

There was no material damage except the usual erosion that occurs with all freshets, and closing of the locks at Oregon City, Oreg., to up-river barge service and to the downstream towing of log rafts.

FLOOD STAGE DATA

(All dates in January unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates From–	To–	Crest* Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE Lake Michigan					
Red Cedar: East Lansing, Mich.	8	4	5	8.8	4
Lake Erie					
St. Marys: Decatur, Ind.	13	2	5	13.4	2-3
St. Joseph: Montpelier, Ohio	10	4	8	12.7	6
Maumee: Fort Wayne, Ind.	15	4	5	16.4	4
Sandusky: Upper Sandusky, Ohio	13	5	5	13.3	5
ATLANTIC SLOPE DRAINAGE					
Chenango: Sherburne, N. Y.	8	4	4	8.4	4
Susquehanna: Oneonta, N. Y.	12	5	6	13.3	5
EAST GULF OF MEXICO DRAINAGE					
Tombigbee:					
Aberdeen, Miss.	34	5	9	38.5	6
Lock No. 4, Demopolis, Ala.	39	6	19	40.6	18
Lock No. 3	33	6	23	42.8	19
Lock No. 1	31	19	22	31.7	21
Pearl: Jackson, Miss.	18	6	24	23.6	13
MISSISSIPPI SYSTEM Ohio Basin					
French Creek: Meadville, Pa.	57	4	5	58.4	5
Allegheny:					
Olean, N. Y.	10	4	4	10.1	4
Lock No. 5, Schenley, Pa.: Upper gage	21	4	5	22.3	4
Lock No. 4, Natrona, Pa.: Upper gage	20	4	5	20.9	4
Lock No. 3, Acmetonia, Pa.: Upper gage	20	4	5	21.2	4
Hocking:					
Enterprise, Ohio	12	4 15	4 16	12.8 14.2	4 15
Athens, Ohio	17	5 15	5 17	17.5 21.2	5 16
Olentangy: Delaware, Ohio	9	4	5	9.4	4
Paint Creek: Bourneville, Ohio	10	4 15	5 16	14.8 15.6	4 15
Scioto:					
La Rue, Ohio	11	4	5	12.6	4
Prospect, Ohio	10	5	6	10.7	5
Circleville, Ohio	14	4 16	5 17	19.0 17.1	5 16
Chillicothe, Ohio	16	5 17	7 17	19.8 16.2	6 17
Piketon, Ohio	15	4 15	8 18	21.3 23.9	7 16
Little Miami:					
Kings Mills, Ohio	17	14	14	17.8	14
Milford, Ohio	12	14	15	12.2	15
Licking: Falmouth, Ky.	28	15	15	28.5	15
Brashears Creek: Taylorsville, Ky.	24	4 14	4 15	24.2 27.2	4 15
Barren: Bowling Green, Ky.	28	5	6	28.4	5
Rough: Dundee, Ky.	25	4 14	9 21	27.2 28.7	6 16
Green:					
Munfordville, Ky.	28	5 15	7 17	30.8 30.6	6 16
Lock No. 6, Brownsville, Ky.	28	5 15	8 19	32.3 37.0	6 17
Lock No. 4, Woodbury, Ky.	33	4 14	10 22	39.6 42.6	7 18
Lock No. 2, Rumsey, Ky.	34	6	31	42.8	22
West Fork:					
Anderson, Ind.	10	4	4	10.0	4
Spencer, Ind.	--	--	--	16.2	16
Elliston, Ind.	18	6 15	6 20	18.0 21.3	6 17
Newberry, Ind.	--	--	--	15.8	18
Edwardsport, Ind.	12	4 14	10 25	16.0 18.7	7 19
MISSISSIPPI SYSTEM (Cont'd.) Ohio Basin (Cont'd.)					
East Fork:					
Seymour, Ind.	14	4 15	4 17	14.2 16.3	4 15
Bedford, Ind.	--	--	--	23.8	19
Williams, Ind.	10	19	21	11.5	19
White: Petersburg, Ind.	16	7 15	12 25	17.8 21.8	9 21
Wabash:					
Wabash, Ind.	12	3 19	6 20	16.2 12.4	4 19
La Fayette, Ind.	11	4	8	17.2	5
Covington, Ind.	16	4 21	9 21	20.2 16.0	5 21
Montezuma, Ind.	--	--	--	19.3	7
Terre Haute, Ind.	14	4	11	16.4	9-11
Hutsonville, Ill.	--	--	--	19.7	10
Riverton, Ind.	--	--	--	17.2	11
Mount Carmel, Ill.	17	10 16	13 26	17.4 19.7	11-12 23
New Harmony, Ind.	15	20	26	15.7	24
Cumberland: Lock F, Eddyville, Ky.	50	15	19	53.1	17
Tennessee: Gilbertsville, Ky.	34	8	21	37.7	18-19
Ohio:					
Dam No. 7, Midland, Pa.	30	5	5	30.9	5
Tell City, Ind.	38	16	23	41.6	20
Dam No. 47, Newburgh, Ind.	38	14	26	43.8	20
Dam No. 48, near Henderson, Ky.	38	15	27	43.4	21
Mount Vernon, Ind.	35	14	28	41.0	22
Dam No. 49, Uniontown, Ky.	37	14	29	42.5	23
Shawneetown, Ill.	33	10	31	42.7	23
Dam No. 50, Fords Ferry, Ky.	34	9	31	45.1	23
Dam No. 51, Golconda, Ill.	40	17	26	41.4	21-23
Paducah, Ky.	39	16	19	39.8	17
Dam No. 52, Brookport, Ill.	37	14	27	41.5	17
Dam No. 53, near Mound City, Ill	42	15	23	45.1	17
Cairo, Ill.	40	16	21	41.3	17
White Basin					
Black: Black Rock, Ark.	14	15	19	17.8	15
Little Red: Judsonia, Ark.	30	16	16	32.1	16
White:					
Clarendon, Ark.	26	22	27	26.2	24
St. Charles, Ark.	25	26	31	25.1	29
Red Basin					
Little Missouri: Boughton, Ark.	20	16	16	20.5	16
Ouachita:					
Arkadelphia, Ark.	17	14	17	21.3	15
Camden, Ark.	26	16	24	34.3	20
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.	20	16	20	21.4	18
St. Francis, Ark.	18	14	26	19.3	21-22
Coldwater: Sarah, Miss.	18	3 13	4 16	20.1 20.6	3 14
Tallahatchie: Swan Lake, Miss.	26	5	†	29.4 29.1	10 16-17
Yazoo: Yazoo City, Miss.	29	22	†	----	—
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La.	25	22	†	25.8	Feb. 1-3
PACIFIC SLOPE DRAINAGE Sacramento Basin					
Sacramento: Fremont Weir, Calif.	33.5	20	31	34.4 36.2	20 24
Russian Basin					
Russian:					
Hopland, Calif.	21	21	22	25.6	21
Guerneville, Calif.	29	22	23	33.6	23

FLOOD STAGE DATA

(All dates in January unless otherwise specified)

Table 5-Continued

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
PACIFIC SLOPE DRAINAGE (Cont'd.)	*Ft.*			*Ft.*	
Eel Basin					
Eel: Fernbridge, Calif.	17.5	21	23	23.3	22
Columbia Basin					
McKenzie:					
Leaburg, Oreg.	12	17	17	13.0	17
		24	24	13.4	24
Coburg Bridge, Oreg.	11	18	18	11.1	18
Santiam: Jefferson, Oreg.	13	3	3	13.3	3
		14	15	13.6	14
		17	18	15.6	17
		21	22	14.5	21
		24	26	16.0	24
Willamette:					
Harrisburg, Oreg.	12	18	18	15.0	18
		24	25	14.2	24
Albany, Oreg.	20	19	19	20.5	19
Oregon City, Oreg.	12	19	28	12.7	20
				13.0	26

* Provisional.
† Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

Standard pressure surface (mb.)	ALBANY, N. Y. (1007 MB.)				ALBUQUERQUE, N. MEX. (837 MB.)				ATLANTA, GA. (985 MB.)				BIG SPRING, TEX. (927 MB.)				BISMARCK, N. DAK. (957 MB.)				BOISE, IDAHO (917 MB.)				BROWNSVILLE, TEX. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	86	-3.1	74	31	1,620	4.0	39	31	307	6.7	69	31	784	5.8	38	31	505	-16.2	77	31	868	-1.6	74	31	6	16.3	78
1,000	31	142			31	142			31	184			31	153			31	166			31	170			31	154	17.0	74
950	31	551	-2.6	63	31	577			31	611	7.8	61	31	578			31	557			31	585			31	594	15.1	71
900	31	976	-4.3	63	31	1,025			31	1,053	6.3	60	31	1,028	8.7	29	31	970	-11.2	68	31	1,018	-0.2	70	31	1,047	14.0	60
850	31	1,426	-5.9	62	31	1,492			31	1,521	4.9	54	31	1,499	7.5	27	31	1,410	-10.4	64	31	1,474	-1.8	67	31	1,528	12.6	53
800	31	1,900	-6.5	56	31	1,987	4.1	33	31	2,014	3.6	46	31	1,997	6.4	27	31	1,876	-10.5	58	31	1,955	-4.2	65	31	2,036	11.2	41
750	31	2,405	-8.3	55	31	2,512	1.0	36	31	2,547	1.8	43	31	2,528	3.8	25	31	2,379	-12.3	55	31	2,465	-6.9	64	31	2,580	8.5	31
700	31	2,936	-10.2	51	31	3,060	-2.3	37	31	3,090	0.7	41	31	3,081	0.7	24	31	2,896	-14.7	51	31	2,996	-10.1	62	31	3,138	5.2	31
650	31	3,508	-13.2	44	31	3,646	-6.1	35	30	3,681	-4.3	42	31	3,680	-2.9		31	3,465	-17.6	46	31	3,568	-12.9	57	31	3,740	1.1	31
600	31	4,109	-16.7	45	31	4,265	-9.9	35	28	4,308	-8.0	39	31	4,301	-7.3		31	4,048	-21.3	44	31	4,170	-16.3	51	31	4,378	-3.0	31
550	31	4,758	-20.8	46	30	4,929	-14.2	37	28	4,980	-12.4		31	4,978	-12.1		31	4,694	-25.3	43	31	4,824	-20.0	49	30	5,063	-7.3	
500	31	5,455	-25.0	43	30	5,643	-19.2	37	28	5,700	-17.0	34	31	5,694	-17.2		31	5,370	-30.0	43	30	5,523	-24.3	49	30	5,798	-11.9	
450	31	6,215	-30.1	43	30	6,419	-24.6	37	28	6,487	-22.4		31	6,477	-22.6		31	6,116	-35.4	47	30	6,286	-29.0	48	30	6,601	-17.5	33
400	30	7,052	-35.5	46	30	7,267	-30.7	37	28	7,337	-28.7		29	7,338	-28.9		31	6,922	-41.1		30	7,116	-34.8	47	30	7,469	-23.9	35
350	29	7,972	-42.0		29	8,193	-37.9		28	8,280	-35.5		28	8,283	-35.5		31	7,817	-47.1		30	8,035	-41.7		30	8,428	-31.3	36
300	29	8,999	-48.8		29	9,239	-45.1		28	9,335	-43.4		26	9,339	-43.2		30	8,828	-51.9		30	9,062	-49.2		30	9,500	-39.8	
250	24	10,185	-54.5		29	10,435	-53.0		27	10,536	-52.2		24	10,533	-51.8		30	10,002	-53.6		30	10,239	-55.5		30	10,719	-49.7	
200	22	11,612	-56.8		28	11,859	-58.9		26	11,957	-57.5		18	11,963	-58.1		27	11,437	-52.4		30	11,649	-57.8		30	12,153	-56.7	
175	21	12,458	-56.0		26	12,699	-59.9		26	12,797	-58.3		15	12,781	-59.9		27	12,301	-51.7		30	12,493	-56.2		29	12,993	-59.5	
150	19	13,450	-55.6		25	13,659	-60.1		25	13,763	-59.9		12	13,749	-61.1		25	13,302	-51.4		29	13,468	-55.1		29	13,949	-62.9	
125	17	14,609	-57.7		23	14,800	-61.2		22	14,876	-62.8		11	14,870	-64.2		23	14,474	-52.4		26	14,630	-56.1		29	15,060	-66.8	
100	8	16,024	-58.4		22	16,177	-64.0		21	16,235	-65.8		10	16,227	-67.6		19	15,920	-54.1		25	16,051	-57.5		29	16,393	-70.7	
80					21	17,535	-65.7		17	17,588	-66.4		8	17,566	-67.8		16	17,347	-54.4		21	17,455	-58.4		23	17,702	-71.0	
60					15	19,295	-62.2		9	19,341	-64.4		7	19,303	-64.4		8	19,193	-55.3		14	19,272	-58.2		18	19,407	-66.6	
50					8	20,444	-62.9		7	20,465	-60.9		5	20,416	-63.5						8	20,440	-57.8		12	20,515	-63.6	
40					5	21,818	-60.9		5	21,867	-58.7														7	21,893	-60.2	
30																												
20																												

Standard pressure surface (mb.)	BUFFALO, N. Y. (991 MB.)				BURRWOOD, LA. (1021 MB.)				CAMAGUEY, CUBA (1005 MB.)				CARIBOU, MAINE (991 MB.)				CHARLESTON, S. C. (1022 MB.)				CIUDAD VICTORIA, MEX (977 MB.)				COLUMBIA, MO. (990 MB)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	221	-1.9	76	31	3	13.9	87	30	122	17.0	92	31	191	-9.3	75	31	13	7.5	80	31	335	21.9	37	30	239	-0.6	67
1,000	31	147			31	179	15.7	71	30	166	18.1	86	31	116			31	190	11.4	65	31	134			30	152		
950	31	558	-2.7	71	31	614	13.1	67	30	612	17.8	79	31	517	-8.6	71	31	622	9.8	58	31	583	20.0	41	30	567	-0.3	56
900	31	983	-4.9	70	31	1,066	10.9	58	30	1,068	14.8	76	31	932	-9.7	67	31	1,066	8.0	52	31	1,043	16.4	47	30	995	-0.8	51
850	31	1,431	-6.1	68	31	1,542	9.5	48	30	1,547	12.4	69	31	1,372	-10.5	66	31	1,536	6.1	47	31	1,527	13.7	50	30	1,451	-1.2	44
800	31	1,904	-7.7	63	31	2,043	7.7	41	30	2,059	11.6	39	31	1,839	-11.0	63	31	2,032	4.9	38	31	2,036	11.2	47	30	1,933	-2.9	43
750	31	2,413	-9.4	57	31	2,579	5.3	36	30	2,602	9.1		31	2,340	-12.4	58	31	2,566	3.0	34	31	2,581	9.1	42	30	2,447	-4.2	41
700	31	2,936	-11.2	56	31	3,133	2.8	30	30	3,165	6.2		31	2,859	-14.0	54	31	3,113	0.3	30	31	3,142	5.7	41	30	2,985	-6.4	40
650	31	3,511	-14.0	60	31	3,732	-0.6		30	3,777	3.3		31	3,426	-16.8	56	31	3,708	-3.3		31	3,746	1.7	40	30	3,567	-9.5	43
600	31	4,106	-17.3	59	31	4,365	-4.5		30	4,414	-0.3		31	4,016	-19.6	52	31	4,332	-6.7		30	4,384	-2.0	33	30	4,175	-13.1	
550	31	4,759	-20.9	57	31	5,046	-8.7		30	5,109	-3.9		31	4,664	-23.3	48	31	5,010	-10.8		30	5,075	-6.0	30	29	4,835	-17.3	39
500	30	5,451	-25.3	52	31	5,777	-13.5		29	5,851	-8.9		31	5,349	-27.6	45	31	5,733	-15.6		29	5,813	-10.7	31	29	5,539	-22.2	40
450	30	6,208	-30.4	52	31	6,571	-19.2		29	6,666	-14.7		31	6,103	-32.4	47	31	6,522	-21.4		29	6,619	-16.4	32	29	6,309	-27.8	37
400	29	7,040	-36.0	50	31	7,435	-25.6		28	7,540	-21.6		31	6,921	-37.7	51	31	7,378	-27.5		29	7,493	-23.1		29	7,142	-33.4	
350	29	7,956	-42.2		31	8,388	-33.2		27	8,510	-29.1		31	7,830	-43.5		31	8,325	-34.4		27	8,461	-30.3		29	8,066	-39.8	
300	26	8,968	-48.7		31	9,453	-41.5		27	9,594	-37.2		31	8,853	-49.0		30	9,396	-42.3		27	9,539	-38.6		29	9,104	-46.3	
250	21	10,133	-52.9		31	10,665	-50.3		27	10,832	-45.5		31	10,038	-52.6		28	10,599	-51.1		27	10,764	-48.8		29	10,297	-53.0	
200	10	11,511	-52.9		31	12,096	-57.1		26	12,294	-54.3		30	11,477	-52.5		25	12,030	-56.5		27	12,198	-57.4		27	11,711	-57.0	
175	6	12,298	-49.2		29	12,936	-59.6		26	13,141	-59.3		28	12,336	-51.1		25	12,874	-57.8		27	13,035	-60.5		26	12,549	-56.5	
150	5	13,277	-48.8		26	13,901	-62.5		25	14,095	-64.6		26	13,344	-52.0		22	13,848	-59.6		27	13,986	-64.3		25	13,534	-55.9	
125					26	15,015	-66.4		24	15,202	-70.7		23	14,522	-52.8		22	14,978	-63.5		25	15,092	-68.1		25	14,687	-58.1	
100					23	16,349	-70.9		18	16,502	-76.0		19	15,965	-54.5		21	16,332	-66.9		22	16,420	-73.6		25	16,084	-60.4	
80					17	17,671	-71.8		13	17,804	-78.1		14	17,399	-55.8		15	17,657	-67.5		19	17,725	-72.8		19	17,473	-59.6	
60					6	19,345	-65.6		7	19,476	-71.7		8	19,230	-55.8		5	19,375	-64.9		13	19,445	-68.1		10	19,276	-60.1	
50									5	20,569	-66.4										7	20,570	-65.3		8	20,412	-59.7	

Standard pressure surface (mb.)	DODGE CITY, KANS. (925 MB.)				EL PASO, TEX. (882 MB.)				ELY, NEV. (808 MB.)				GLASGOW, MONT. (939 MB.)				GRAND JUNCTION, COLO (852 MB.)				GREAT FALLS, MONT. (884 MB.)				GREENSBORO, N. C. (989 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	792	-1.8	63	31	1,195	8.8	30	31	1,908	-4.0	67	31	648	-13.7	73	31	1,474	-3.1	69	31	1,128	-8.0	66	31	273	3.1	74
1,000	31	159			31	138			31	178			31	164			31	185			31	156			31	182	-	
950	31	575			31	576			31	601			31	562			31	606			31	567			31	605	5.2	56
900	31	1,007	2.1	48	31	1,030			31	1,038			31	972	-9.9	63	31	1,040			31	990			31	1,041	3.7	53
850	31	1,468	1.3	40	31	1,504	9.7	28	31	1,498			31	1,414	-9.6	58	31	1,494			31	1,434	-7.3	55	31	1,505	2.6	48
800	31	1,955	-0.2	38	31	2,004	6.7	29	31	1,984	-1.3	55	31	1,881	-10.7	59	31	1,978	-1.6	51	31	1,905	-8.6	55	31	1,993	1.2	44
750	31	2,473	-2.1	38	31	2,535	4.0	31	31	2,503	-2.6	50	31	2,379	-12.9	56	31	2,498	-3.8	50	31	2,407	-11.5	58	31	2,517	-0.5	40
700	31	3,016	-3.7	36	31	3,088	0.7	32	31	3,042	-6.0	53	31	2,899	-15.1	54	31	3,031	-6.6	51	31	2,929	-14.3	61	31	3,060	-2.9	35
650	31	3,602	-7.0	36	31	3,684	-3.2	29	31	3,621	-9.3	52	31	3,461	-18.5	51	31	3,616	-10.0	53	31	3,495	-17.7	61	31	3,652	-6.2	32
600	31	4,217	-11.1	36	31	4,307	-7.1		31	4,234	-12.9	48	31	4,048	-22.3	50	31	4,220	-13.6	54	31	4,082	-21.1	55	31	4,266	-9.6	29
550	31	4,882	-15.3	35	31	4,982	-11.8		31	4,896	-16.8	43	31	4,687	-26.3	47	31	4,885	-17.7	50	31	4,725	-24.9	51	31	4,938	-13.8	32
500	31	5,593	-20.3	34	30	5,700	-16.8		31	5,602	-21.1	43	31	5,364	-30.9	46	31	5,583	-22.3	46	31	5,406	-29.5	48	31	5,650	-18.9	35
450	30	6,369	-25.6		30	6,484	-22.5		31	6,375	-26.6	40	31	6,108	-36.0	44	31	6,355	-27.7	43	31	6,155	-34.7	48	31	6,432	-24.3	
400	30	7,210	-31.9		30	7,337	-28.9		30	7,212	-32.9		31	6,913	-41.3		31	7,184	-33.8	42	31	6,964	-40.3		31	7,276	-30.3	
350	30	8,139	-38.8		29	8,283	-35.7		30	8,138	-39.7		31	7,808	-47.1		31	8,107	-40.6		31	7,862	-46.4		31	8,212	-37.1	
300	30	9,179	-46.6		28	9,332	-43.3		30	9,174	-47.3		30	8,816	-52.2		31	9,139	-47.9		31	8,871	-52.2		30	9,259	-44.5	
250	28	10,361	-54.0		27	10,536	-51.3		30	10,358	-54.9		29	9,984	-54.0		30	10,326	-54.9		29	10,037	-55.0		30	10,458	-52.1	
200	28	11,775	-57.7		24	11,956	-58.5		30	11,768	-58.6		29	11,417	-52.5		29	11,737	-57.9		26	11,459	-54.1		30	11,884	-56.9	
175	27	12,619	-57.0		22	12,804	-60.7		29	12,604	-58.6		29	12,282	-51.3		29	12,578	-58.1		21	12,312	-52.6		30	12,728	-57.4	
150	26	13,595	-57.0		22	13,760	-61.1		29	13,565	-57.3		29	13,283	-51.1		29	13,550	-57.3		20	13,306	-51.7		27	13,689	-58.6	
125	25	14,746	-58.9		20	14,888	-63.0		26	14,709	-58.5		29	14,465	-52.2		28	14,698	-58.1		16	14,478	-53.1		22	14,828	-61.8	
100	21	16,142	-61.7		19	16,252	-66.3		24	16,112	-60.6		27	15,914	-54.1		27	16,093	-61.1		15	15,900	-54.9		21	16,197	-63.7	
80	16	17,513	-63.4		18	17,599	-67.4		21	17,487	-61.5		24	17,345	-54.5		25	17,467	-61.6		13	17,332	-55.7		21	17,560	-64.7	
60	12	19,279	-62.6		13	19,333	-64.3		14	19,279	-60.2		13	19,171	-55.7		15	19,255	-60.4		10	19,175	-55.5		13	19,314	-62.7	
50	9	20,405	-60.9		9	20,439	-61.8		7	20,423	-59.9		7	20,323	-56.1		5	20,395	-60.5		6	20,342	-54.6		7	20,439	-61.4	
40	5	21,773	-60.4		6	21,839	-58.3																					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20--Continued

JANUARY 1951

Standard pressure surface (mb.)	HATTERAS, N. C. (1022 MB.)								HILO, T. H. (1016 MB.)				INTERNAT. FALLS, MINN. (972 MB.)				JOLIET, ILL. (996 MB.)				LAKE CHARLES, LA. (1019 MB.)				LANDER, WYO. (825 MB)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	9.3	77					31	9	23.3	75	31	361	-16.8	77	31	179	- 4.9	79	31	5	10.5	82	31	1,696	- 6.2	48
1,000--	31	179	9.8	67					31	143	22 2	76	31	145			31	145			31	166	12.0	71	31	161		
950----	31	610	8.1	60					31	588	18.8	79	31	533			31	555	- 4.6	72	31	599	11.2	64	31	578		
900----	31	1,050	6.0	56					31	1,051	15.5	80	31	942	-14.3	71	31	974	- 4.7	64	31	1,046	10.2	62	31	1,011		
850----	31	1,516	3.9	49					31	1,534	12.6	80	31	1,377	-13.5	66	31	1,423	- 5.5	60	31	1,521	8.8	57	31	1,463		
800----	31	2,007	2.1	47					31	2,042	10.2	71	31	1,837	-13.9	59	31	1,898	- 6.7	55	31	2,021	7.1	52	31	1,942	- 4.0	41
750----	31	2,536	0.4	43					31	2,583	8.4	55	31	2,334	-15.1	55	31	2,409	- 7.9	47	31	2,560	5 1	45	31	2,455	- 6.7	39
700----	31	3,077	- 1 8	38					31	3,145	5.7	45	31	2,845	-17.7	52	31	2,935	- 9.6	45	31	3,110	1 7	47	31	2,984	- 9 7	41
650----	31	3,669	- 5.0	35					31	3,752	2.9	35	31	3,406	-20.7	47	31	3,515	-12.5	46	31	3,706	- 1.8	41	31	3,560	-12.9	44
600----	31	4,288	- 8.5	32					31	4,393	- 0.7		31	3,984	-24.0	47	31	4,112	-16.1	47	31	4,335	- 5 9	36	31	4,159	-16.4	44
550----	31	4,959	-12 6	32					31	5,082	- 4.9		31	4,621	-27.8	46	31	4,767	-20.1	46	31	5,015	-10 4		31	4,810	-20.5	41
500----	31	5,679	-17.2						31	5,825	- 9.6		31	5,292	-31.7	48	31	5,462	-24.7	44	31	5,737	-15.2		31	5,505	-25.4	44
450----	31	6,465	-22 6						31	6,638	-15.2		30	6,035	-36.5	47	31	6,225	-29.9	45	31	6,530	-20 7		31	6,265	-30.8	43
400----	31	7,315	-28.8						31	7,511	-21.6		30	6,838	-42.0		30	7,051	-35.8	48	31	7,385	-26 8		31	7,086	-36.8	44
350----	31	8,257	-35 4						31	8,483	-27.9		30	7,728	-48.2		29	7,974	-42.2		30	8,335	-33.5		31	7,997	-43.3	
300----	31	9,313	-43.0						31	9,573	-35.2		28	8,734	-52.8		28	8,997	-49.0		30	9,399	-41.2		31	9,019	-50.0	
250----	31	10,517	-51 2						31	10,822	-43.3		27	9,901	-53.0		27	10,178	-54.5		30	10,612	-50 4		30	10,192	-55.1	
200----	30	11,948	-56 0						31	12,292	-53.1		26	11,345	-50.8		22	11,575	-54.9		29	12,039	-57.6		29	11,608	-56.9	
175----	30	12,794	-56.9						29	13,141	-58.6		24	12,216	-49.7		22	12,429	-54.3		29	12,878	-59.1		29	12,456	-55.3	
150----	29	13,766	-58.2						27	14,096	-64.9		22	13,222	-49.8		22	13,417	-54.3		29	13,838	-61 5		29	13,439	-54.7	
125----	28	14,913	-60.8						19	15,194	-70.7		21	14,409	-51.1		20	14,587	-55.5		27	14,963	-64 9		24	14,609	-55.3	
100----	27	16,286	-63.4						11	16,488	-76.8		15	15,857	-52.7		18	16,001	-57.6		23	16,317	-68.5		24	16,025	-57.8	
80-----	22	17,655	-65.1						6	17,786	-79.1		11	17,297	-53.2		16	17,400	-58.4		20	17,644	-69.1		21	17,421	-58 3	
60-----	7	19,437	-62.2										8	19,161	-55.6		13	19,202	-58.3		14	19,377	-66.7		14	19,232	-58.1	
50-----																	7	20,342	-58.0		10	20,495	-64.0		8	20,352	-57.9	
40-----																					6	21,883	-60.3					

Standard pressure surface (mb.)	LAS VEGAS, NEV. (940 MB.)				LITTLE ROCK, ARK. (1010 MB.)				MAZATLAN, MEXICO (1013 MB.)				MEDFORD, ORE. (971 MB.)				MERIDA, MEXICO (1015 MB.)				MIAMI, FLA. (1021 MB.)				NANTUCKET, MASS. (1016 MB.)			
SURFACE	31	660	6.4	46	31	79	5.8	68	31	14	20.8	76	31	401	4.0	82	31	27	22.8	69	31	4	17.2	73	31	14	1.9	81
1,000--	31	146			31	160	6.5	62	31	123	20.1	70	31	162			31	158	22.1	67	31	184	18.3	67	31	138	2.5	73
950----	31	574			31	586	6.0	59	31	573	20.8	42	31	583	4.2	73	31	604	19.9	64	31	623	15.2	69	31	553	1.2	67
900----	31	1,020	9.1	37	31	1,024	4.8	58	31	1,033	19.0	35	31	1,019	2.3	70	31	1,067	16.9	66	31	1,078	12.1	65	31	987	- 0.4	60
850----	31	1,491	6.5	38	31	1,490	4.1	53	31	1,521	16.1	32	31	1,479	0.0	67	31	1,553	13.5	69	31	1,555	10.1	53	31	1,443	- 2.0	59
800----	31	1,986	3.9	41	31	1,982	2.9	47	31	2,033	12.9	29	31	1,963	- 2.3	65	31	2,061	11.3	57	31	2,058	9.2	37	31	1,924	- 3.2	52
750----	31	2,515	1.2	39	31	2,509	1 0	48	31	2,574	9.6		31	2,480	- 4.4	61	31	2,604	9.4	41	31	2,595	7.5	26	31	2,436	- 5.2	49
700----	31	3,060	- 1.6	33	31	3,055	- 1.8	49	31	3,140	5.9		31	3,014	- 6.7	55	31	3,168	6.5	39	31	3,157	5.5		31	2,972	- 7.7	46
650----	31	3,650	- 5.4	34	31	3,646	- 5.0	44	31	3,740	2.0		31	3,595	- 9.8	46	31	3,781	3.5	31	31	3,764	2.2		31	3,548	-10.7	45
600----	31	4,269	- 9.4	33	30	4,263	- 8.3	38	31	4,382	- 2 2		31	4,203	-13.2	42	31	4,418	- 0.2	27	31	4,401	- 1.6		31	4,156	-14.4	45
550----	31	4,939	-13.8	30	30	4,936	-13.4	37	31	5,065	- 6.7		31	4,866	-16.9	42	31	5,110	- 4.2		31	5,090	- 5.8		31	4,814	-18.2	42
500----	31	5,653	-19.1		30	5,649	-18.4		29	5,807	-11.8	39	31	5,569	-21.8	43	31	5,853	- 9.4		31	5,828	-10.5		31	5,517	-22.6	41
450----	31	6,432	-24.8		30	6,431	-23.8		29	6,611	-17.2	37	30	6,352	-26.9	43	31	6,664	-15.0		31	6,634	-16.4		31	6,289	-27.6	40
400----	31	7,275	-31.5		30	7,277	-30.0		29	7,479	-23.4	39	30	7,185	-33.0	43	31	7,540	-21.8		31	7,506	-23.0		31	7,120	-33.4	40
350----	30	8,208	-38.3		30	8,214	-36.8		28	8,440	-30.8		29	8,109	-40.2		31	8,507	-29.5		31	8,470	30.3		31	8,045	-39.7	
300----	30	9,252	-45.5		30	9,265	-43.8		26	9,518	-39.3		29	9,143	-47.8		31	9,587	-37.7		31	9,547	-38.6		31	9,082	-46.7	
250----	30	10,445	-53.1		30	10,466	-52 0		26	10,738	-49.0		29	10,324	-55.6		31	10,817	-47.6		31	10,775	-47.2		31	10,272	-53.1	
200----	30	11,863	-58.4		25	11,898	-57.6		25	12,165	-59.2		28	11,727	-60.0		31	12,259	-56.5		28	12,222	-55.0		30	11,692	-56.1	
175----	28	12,702	-58.4		23	12,740	-58.1		25	12.995	-62.0		29	12,561	-59.0		31	13,095	-61.5		21	13,061	-58.0		27	12,513	-55.1	
150----	28	13,670	-59.0		23	13,705	-60.2		23	13,946	-66.1		29	13,532	-57.3		29	14,032	-66.7		20	14,007	-63.6		23	13,493	-54 7	
125----	28	14,809	-60.4		21	14,830	-62.0		16	15,042	-68.0		27	14,694	-58.4		23	15,112	-72.0		20	15,114	-67.7		22	14,652	-56.0	
100----	27	16,198	-63.2		19	16,197	-64.2		12	16,369	-71.0		27	16,088	-61.0		14	16,419	-76.7		20	16,440	-72.5		18	16,053	-58.0	
80-----	26	17,566	-64.1		18	17,558	-65.1		9	17,670	-73.0		24	17,472	-61.9		9	17,697	-77.6		17	17,743	-72.0		11	17,445	-58.2	
60-----	19	19,341	-62.4		12	19,306	-63.7		6	19,364	-69.9		18	19,259	-60.7						9	19,458	-66.7		9	19,255	-58.6	
50-----	16	20,475	-61.5		9	20,433	-61.7						14	20,387	-59.9						5	20,511	-65.5					
40-----	6	21,861	-60.7										5	21,758	-58.6													

Standard pressure surface (mb.)	NASHVILLE, TENN. (999 MB.)				NORTH PLATTE, NEBR. (917 MB)				OAKLAND, CALIF. (1020 MB.)				OKLAHOMA CITY, OKLA (972 MB.)				OMAHA, NEBR. (982 MB.)				PHOENIX, ARIZ. (977 MB.)				PITTSBURGH, PA. (973 MB.)			
SURFACE	31	177	4.5	74	31	849	- 4.4	65	31	6	9.4	77	30	391	3.0	59	30	308	- 5.6	73	31	338	10.1	55	31	382	- 0.3	72
1,000--	31	166			31	151			31	170	9.6	74	30	155			30	163			31	138			31	157	[illegible]	
950----	31	589	3.9	63	31	566			31	601	8.3	69	30	577	5.1	49	30	573	- 4.5	60	31	574	14.1	38	31	573	0.3	65
900----	31	1,024	3.3	58	31	995	- 2.1	53	31	1,042	6.9	58	30	1,014	4.2	43	30	994	- 3.7	53	31	1,024	11.4	37	31	1,001	- 1.3	63
850----	31	1,486	2.6	53	31	1,449	- 2.8	47	31	1,510	4 8	52	30	1,478	3.5	41	30	1,444	- 4.0	50	31	1,498	8.3	36	31	1,455	- 3.1	62
800----	31	1,975	0.9	48	31	1,928	- 4.1	46	31	2,002	2.2	52	30	1,970	3.3	38	30	1,921	- 5.6	46	31	1,996	5.4	38	31	1,934	- 4.6	57
750----	31	2,498	- 1 6	45	31	2,441	- 6.6	44	31	2,527	- 0.4	49	30	2,497	1.6	35	30	2,432	- 6.9	44	31	2,525	2.8	35	31	2,449	- 5.9	57
700----	31	3,038	- 3.9	43	31	2,972	- 8.8	46	31	3,070	- 2.9	43	30	3,044	- 1.2	27	30	2,962	- 9.0	44	31	3,075	- 0.5	35	31	2,979	- 7.9	58
650----	31	3,627	- 7 2	41	31	3,551	-11.8	45	30	3,660	- 6.1	36	30	3,638	- 4.8		30	3,542	-11.8	45	31	3,666	- 4.3	34	31	3,562	-10.8	55
600----	31	4,239	-10.7	36	31	4,152	-15 1	47	30	4,277	- 9.7	37	30	4,255	- 8.8	28	30	4,142	-15.1	46	31	4,290	- 8.2	33	31	4,163	-14.5	49
550----	31	4,908	-14 8	37	31	4,810	-19 3	48	30	4,945	-14.1	40	30	4,930	-13.3		30	4,802	-19.4	51	31	4,960	-13.0	33	31	4,823	-18.0	44
500----	31	5,617	-19.5	34	30	5,505	-23 7	44	30	5,660	-19.2	41	30	5,642	-18.2		30	5,497	-24.1	49	31	5,678	-18 3	32	31	5,524	-22.4	41
450----	31	6,393	-24.9		29	6,274	-28.9	40	30	6,437	-24.9	42	29	6,427	-23.8		30	6,260	-29.4	46	31	6,458	-24.1	31	31	6,293	-27.8	40
400----	30	7,235	-31.3		29	7,100	-35.1	40	30	7,281	-31.3	44	29	7,272	-30.1		30	7,089	-35.6		31	7,304	-30.7	33	31	7,126	-33.7	41
350----	29	8,164	-37.8		29	8,016	-42.2		30	8,212	-38.4	43	26	8,219	-37.2		30	8,004	-42.4		31	8,238	-37.4		30	8,044	-40 4	
300----	29	9,210	-44.9		29	9,041	-49.9		29	9,258	-46.2		26	9,265	-44.9		30	9,030	-49.4		31	9,286	-44 7		30	9,080	-47.1	
250----	28	10,414	-52 8		23	10,217	-55.1		29	10,447	-54.4		25	10,463	-53.2		30	10,208	-54.5		31	10,485	-51.8		29	10,262	-53.1	
200----	27	11,833	-57.5		23	11,633	-56.8		28	11,863	-60.0		25	11,875	-59.0		30	11,629	-55.9		28	11,909	-58 2		25	11,682	-56.0	
175----	27	12,673	-58.1		22	12,476	-55.0		28	12,694	-60.2		25	12,711	-59.4		29	12,478	-54.7		26	12,740	-60.0		25	12,531	-55.8	
150----	25	13,642	-59.1		21	13,458	-54.7		26	13,667	-58.9		25	13,674	-60.1		29	13,464	-54.6		25	13,702	-59 5		21	13,510	-56.0	
125----	25	14,778	-61.3		20	14,621	-56.4		24	14,810	-60.2		24	14,802	-61.4		26	14,617	-56.2		22	14,835	-61.0		20	14,664	-57.2	
100----	22	16,141	-63.3		16	16,041	-58.8		21	16,213	-64.0		24	16,177	-63.7		23	16,019	-58.0		20	16,211	-64 5		15	16,066	-58.9	
80-----	21	17,504	-64.4		14	17,437	-60.1		21	17,576	-64.3		22	17,542	-64.4		19	17,423	-58.3		14	17,564	-65.4		11	17,473	-60.8	
60-----	16	19,276	-62.9		9	19,248	-59.4		10	19,343	-63.7		13	19,315	-62.2		12	19,229	-58.3		10	19,305	-63.0					
50-----	14	20,392	-62.2		[illegible]	20,406	-59.3		8	20,470	-62.4		8	20,445	-61.5		9	20,375	-57.8		9	20,423	-62.0					
40-----	8	21,778	-59.8																									

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JANUARY 1951

Standard pressure surface (mb.)	PORTLAND, MAINE. (1014 MB.)				RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (979 MB.)				SAN ANTONIO, TEX. (991 MB.)				SAN JUAN, P. R. (1015 MB.)				SANTA MARIA, CALIF (1011 MB)				S. STE MARIE, MICH. (988 MB)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	20	- 3.4	76	23	966	- 7 8	64	31	317	-15.0	73	30	240	10 5	53	31	19	23.2	81	31	71	9 2	83	30	221	- 9.2	80
1,000--	31	128	- 2.0	68	23	159			31	152			30	163			31	149	22 9	77	31	165	10 6	74	30	126		
950----	31	537	- 2.4	64	23	571			31	550	-12.3	72	30	597	11.6	48	31	595	19.7	78	31	602	10 8	60	30	529	- 8.7	77
900----	31	964	- 4.1	64	23	994			31	959	- 9 4	62	30	1,046	11.0	50	31	1,058	16 2	81	31	1,043	9 2	50	30	942	-10 2	75
850----	31	1,413	- 5.3	62	23	1,442	- 4 6	52	31	1,401	- 9.4	56	30	1,522	9.8	49	31	1,543	13.3	78	31	1,515	6.9	46	30	1,382	-11.3	69
800----	31	1,888	- 6.2	57	23	1,918	- 6.1	50	31	1,868	-10.6	51	30	2,024	8.5	36	31	2,052	11 0	70	31	2,010	4.4	44	30	1,846	-12 6	63
750----	31	2,398	- 7.7	53	23	2,424	- 8.8	47	31	2,369	-12 5	46	30	2,559	6.2	30	31	2,597	9.5	50	31	2,540	2 2	38	30	2,343	-14.0	61
700----	31	2,926	-10 0	48	23	2,951	-11.8	48	31	2,887	-14.7	41	30	3,116	3.0		31	3,159	7.3	35	31	3,088	- 0.7	34	30	2,858	-16.0	58
650----	31	3,499	-12.9	49	23	3,524	-14.9	47	31	3,457	-17.2	42	30	3,713	- 0.7		31	3,773	4.8		31	3,681	- 4 3	29	30	3,419	-18.8	55
600----	31	4,101	-16.2	46	23	4,117	-18.2	45	31	4,042	-20.5	43	30	4,347	- 4.8		31	4,413	1.3		31	4,303	- 8.0	29	30	4,005	-22 2	54
550----	31	4,753	-20.2	46	23	4,766	-22.5	46	31	4,684	-24.4	46	30	5,027	- 9.1		31	5,113	- 2.9		31	4,977	-12.3	33	30	4,647	-26.3	52
500----	31	5,451	-25.0	47	23	5,455	-27.0	49	31	5,370	-28.6	45	30	5,757	-14.1		30	5,854	- 7.8		30	5,702	-17.2	34	30	5,323	-30 3	53
450----	31	6,210	-30.1	45	23	6,204	-32.1	48	31	6,118	-33.4	43	30	6,550	-19.5		30	6,672	-13.6		30	6,488	-23.0	34	30	6,070	-35.0	53
400----	30	7,038	-36.1	44	23	7,028	-37.9		31	6,935	-39.2		29	7,414	-25.5		29	7,549	-20.0		30	7,336	-29.5	32	30	6,879	-40.2	
350----	30	7,952	-42.4		23	7,935	-44.4		31	7,837	-45.6		29	8,366	-33.0		28	8,525	-27.2		30	8,274	-36 6		30	7,778	-45.9	
300----	30	8,980	-48.7		23	8,952	-50.8		31	8,851	-51.2		29	9,432	-41.0		28	9,618	-35.0		30	9,325	-44.4		30	8,790	-51 1	
250----	29	10,165	-53.5		22	10,132	-54.3		31	10,028	-53.6		27	10,645	-49.7		27	10,869	-43.1		26	10,532	-52.7		29	9,971	-53.8	
200----	23	11,601	-54.7		21	11,556	-54.7		31	11,465	-52.0		21	12,079	-57.4		25	12,342	-53.9		25	11,943	-59 5		28	11,398	-51 9	
175----	23	12,455	-54.2		20	12,415	-52.8		31	12,332	-51.1		21	12,917	-60.1		23	13,192	-59.9		25	12,774	-60 3		28	12,264	-51.2	
150----	17	13,458	-55.3		19	13,409	-53.3		31	13,334	-51.1		21	13,874	-61.2		23	14,140	-66.5		25	13,735	-59 7		28	13,264	-51.4	
125----	13	14,628	-56.7		17	14,578	-55.1		30	14,517	-52.6		20	14,998	-63.8		21	15,227	-73.1		25	14,871	-61.5		27	14,446	-52.7	
100----	10	16,026	-57.3		16	16,010	-56.9		27	15,957	-54.6		18	16,361	-66.8		17	16,519	-78.0		24	16,250	-64.7		25	15,872	-55 0	
80-----	7	17,406	-58.7		14	17,418	-56.9		23	17,384	-55.2		13	17,709	-69.6		14	17,781	-79.3		21	17,599	-65 2		21	17,296	-55.9	
60-----	5	19,211	-58.1		9	19,213	-57.9		17	19,221	-56.4		10	19,433	-67.4		6	19,419	-72.5		15	19,357	-64.4		14	19,106	-57 1	
50-----					9	20,361	-57.8		10	20,351	-57.4		9	20,529	-65.5						5	20,505	-63 5		10	20,265	-57.6	
40-----									6	21,753	-56.6		5	21,891	-63.8													

Standard pressure surface (mb.)	SPOKANE, WASH. (931 MB.)				SWAN ISLAND, W. I (1016 MB.)				TACUBAYA, MEXICO (774 MB)				TAMPA, FLA. (1022 MB.)				TATOOSH ISLAND, WASH. (1009 MB)				TOLEDO, OHIO (994 MB)				WASHINGTON, D. C. (1010 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	722	- 2.5	80	31	10	23.8	77	31	2,306	15 0	38	31	5	14.1	79	31	31	5.0	81	31	191	- 2.0	81	31	88	3 2	64
1,000--	31	147			31	152	23.3	77	31	73			31	192	15.5	69	31	106			31	140			31	168	3.9	59
950----	31	558			31	603	19.9	82	31	679			31	628	13.7	63	31	523	1 9	79	31	549	- 3.0	74	31	587	2.6	58
900----	31	988	- 2.6	74	31	1,063	16.7	82	31	1,009			31	1,081	10.7	61	31	956	- 0.8	78	31	976	- 3 7	68	31	1,020	0.7	57
850----	31	1,440	- 4.9	68	31	1,548	13.7	79	31	1,500			31	1,556	8.6	60	31	1,410	- 3.7	78	31	1,426	- 5.1	65	31	1,478	- 0.5	52
800----	31	1,914	- 7.3	63	30	2,058	11.6	67	31	2,028			31	2,056	7.0	45	31	1,887	- 5.9	72	31	1,901	- 6 4	61	31	1,962	- 1.7	44
750----	31	2,420	- 9.8	61	30	2,602	9.7	47	31	2,580	14.2	35	31	2,586	5.3	31	31	2,394	- 8.6	68	31	2,411	- 7.8	57	31	2,482	- 3 2	40
700----	31	2,945	-12.6	58	30	3,167	7.4	34	31	3,151	10.1	38	31	3,145	3.2		31	2,921	-11.9	63	31	2,939	- 9 8	55	31	3,017	- 6 0	41
650----	31	3,512	-16.1	58	30	3,781	4.5		31	3,767	5.0	45	30	3,744	- 0.2		31	3,492	-15.4	61	31	3,517	-12.5	51	31	3,599	- 8 8	40
600----	31	4,105	-19.8	57	30	4,421	1.1		31	4,410	- 0.2	47	30	4,377	- 3.6		31	4,086	-18.9	57	31	4,116	-15.6	48	31	4,210	-12.7	41
550----	31	4,748	-23.6	51	30	5,117	- 3.0		31	5,103	- 4.9	42	30	5,058	- 7.7		31	4,734	-22.7	53	31	4,772	-19.7	48	31	4,873	-16.8	37
500----	31	5,436	-28.1	50	29	5,861	- 7.7		31	5,844	- 9.3	34	30	5,793	-12.6		31	5,423	-26.6	52	30	5,465	-24 6	46	31	5,577	-21.6	38
450----	31	6,188	-33.1	47	28	6,675	-13.0		30	6,660	-14.5		30	6,592	-18.2		31	6,177	-31.9	49	30	6,227	-29.7	46	31	6,350	-26 8	38
400----	31	7,003	-38.7		27	7,558	-19.9		27	7,531	-21.2		30	7,458	-24.6		31	6,999	-37.5	47	30	7,055	-35.4	46	31	7,186	-32.2	35
350----	30	7,910	-44.4		26	8,532	-27.4		21	8,499	-29.4		28	8,410	-32.1		31	7,907	-43.8		30	7,972	-41.7		31	8,115	-38 9	
300----	29	8,932	-50.8		25	9,619	-36.5		18	9,581	-38.2		28	9,479	-40.4		31	8,927	-50.1		30	9,002	-48.0		31	9,155	-46.3	
250----	26	10,114	-55.5		25	10,856	-45.9		14	10,802	-48.5		28	10,697	-49.2		29	10,092	-54.5		29	10,183	-53 7		31	10,346	-53 2	
200----	24	11,545	-55.6		25	12,309	-55.3		13	12,239	-58.8		28	12,134	-55.9		26	11,496	-54.6		28	11,617	-55 0		31	11,764	-57.5	
175----	23	12,388	-54.6		24	13,150	-60.7		11	13,075	-63.1		28	12,978	-58.7		20	12,384	-54.2		28	12,472	-54.3		31	12,606	-57 7	
150----	23	13,379	-53.3		24	14,095	-66.5		8	14,002	-68.6		27	13,934	-62.1		20	13,373	-54.0		26	13,445	-54.4		30	13,578	-57.0	
125----	20	14,553	-54.6		23	15,178	-72.2		6	15,088	-71.4		25	15,045	-66.6		15	14,550	-54.6		22	14,612	-57.0		29	14,724	-58 8	
100----	16	15,979	-55.9		23	16,470	-78.1						23	16,376	-71.6		12	15,982	-56.0		14	16,023	-59.4		27	16,119	-61 6	
80-----	12	17,371	-55.9		21	17,741	-78.2						18	17,694	-71.4		10	17,408	-56.9		8	17,406	-59.9		24	17,485	-62.0	
60-----	9	19,193	-55.9		19	19,404	-71.6						16	19,412	-67.2		7	19,250	-56.5						21	19,254	-61.1	
50-----	6	20,344	-55.3		18	20,490	-67.6						10	20,516	-64.0										18	20,382	-59.6	
40-----					15	21,838	-63.0						9	21,902	-58.7										7	21,769	-57.6	
30-----					9	23,618	-57.3																					

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200 G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating orange of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

JANUARY 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	262	2.2	31	262	1.1	29	250	1.1	30	251	2.4	28	293	1.7	28	48	0.4
500	--	---	----	--	---	----	29	248	1.9	--	---	----	28	287	5.5	--	---	----
1,000	31	252	4.3	--	---	----	26	234	5.0	--	---	----	26	290	8.1	28	160	.5
1,500	27	242	7.1	--	---	----	21	265	7.2	30	256	6.8	24	296	11.3	28	239	2.7
2,000	26	251	9.1	31	258	2.4	20	277	8.9	29	275	9.9	20	296	13.6	28	257	5.5
2,500	26	259	10.4	30	277	5.2	18	283	12.7	26	280	12.4	20	295	14.7	24	267	7.8
3,000	25	269	12.4	28	292	8.4	18	276	15.2	22	288	12.3	20	296	15.2	20	268	8.8
4,000	25	264	15.2	24	294	14.1	17	278	16.3	17	290	15.0	17	298	18.6	13	287	13.7
5,000	23	272	16.5	24	290	15.9	13	271	19.5	17	296	18.7	14	292	22.0	12	293	19.1
6,000	22	277	18.5	24	288	19.3	12	266	22.8	14	305	21.7				10	307	20.4
8,000	18	277	24.9	21	292	21.8												
10,000				18	290	26.8												
12,000				10	284	31.0												
14,000																		

Altitude (meters) m.s.l.	Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	27	154	5.0	30	246	3.3	28	229	2.0	29	241	1.7	25	216	2.7	31	252	2.9
500	27	169	7.0	30	242	5.4	28	228	4.3	29	235	3.5	25	217	4.6	--	---	----
1,000	25	190	5.2	17	237	10.8	24	254	7.3	28	248	4.6	19	228	8.6	--	---	----
1,500	20	227	4.8	13	242	14.8	15	272	9.9	24	271	7.7	16	246	10.0	31	257	4.0
2,000	15	247	5.9				10	282	14.1	22	273	10.1	14	265	12.1	31	269	5.6
2,500	12	265	5.2							22	272	11.4	13	278	13.8	30	273	7.3
3,000	12	267	6.2							20	275	13.9	11	287	16.8	28	274	10.0
4,000	11	274	10.0							19	273	17.4				28	275	12.4
5,000	10	276	11.6							18	273	18.1				26	273	13.4
6,000										16	271	21.8				24	274	16.2
8,000										10	285	25.7				20	286	21.3
10,000																17	285	22.3
12,000																14	294	25.1
14,000																11	281	30.0

	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)		
Surface	30	196	1.1	31	305	1.6	27	248	3.4	29	277	2.1	31	83	0.5	25	246	1.4
500	--	---	----	--	---	----	27	246	4.9	--	---	----	31	215	1.9	25	246	2.9
1,000	--	---	----	--	---	----	27	248	7.6	29	262	6.1	30	227	3.8	18	256	5.9
1,500	--	---	----	31	310	1.7	26	261	10.9	25	271	10.4	28	243	4.9	18	261	8.2
2,000	30	225	1.1	31	318	2.0	21	271	12.7	24	277	11.9	24	268	6.0	18	268	10.4
2,500	30	255	2.6	29	250	3.2	19	273	14.0	18	286	13.1	23	276	7.7	16	273	11.2
3,000	28	280	5.7	28	260	6.9	17	280	17.3	17	290	12.9	23	275	9.3	15	278	12.7
4,000	22	296	12.2	26	287	11.2	17	275	18.7	17	292	13.5	21	274	10.9	12	284	17.1
5,000	17	301	17.4	21	294	14.1	11	275	22.3	15	294	14.2	20	268	15.6	10	292	17.1
6,000	15	301	16.9	20	301	18.6				11	303	15.0	17	274	17.7			
8,000				14	309	23.9							12	276	22.9			
10,000																		

	Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
Surface	31	27	0.4	24	226	2.4	27	262	0.3	31	93	2.8	28	164	2.1	25	220	2.9
500	--	---	----	24	233	4.6	27	264	.4	31	99	4.0	27	188	3.6	25	213	5.7
1,000	31	346	.7	22	241	6.0	26	180	2.1	30	104	3.5	22	260	3.6	21	233	7.9
1,500	31	274	1.9	20	263	9.8	22	201	5.0	28	83	2.7	16	301	7.0	16	254	9.2
2,000	31	280	3.6	19	271	11.5	17	215	5.9	24	304	.8	15	300	8.9	13	276	11.1
2,500	29	284	5.2	19	279	13.2	12	234	5.0	24	277	1.4	15	297	10.4	12	277	12.3
3,000	28	284	7.0	19	278	14.8	10	271	6.1	24	277	2.5	14	278	12.3	12	279	15.4
4,000	26	297	9.7	17	281	18.5				20	287	5.3	12	281	15.6	10	278	19.6
5,000	25	306	12.0	16	283	21.5				20	278	9.1	11	281	17.7			
6,000	22	290	14.7	13	284	22.8				18	278	11.8						
8,000	16	294	19.4							17	273	19.9						
10,000	10	291	17.1															

	New York, N.Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)		
Surface	26	277	4.4	31	237	1.1	28	280	2.6	31	320	2.5	31	141	0.7	30	334	2.8
500	26	262	6.5	31	273	2.2	28	279	2.7	31	304	3.0	31	151	.7	--	---	----
1,000	26	272	8.8	23	310	2.9	27	262	3.5	31	305	5.3	31	146	.5	30	332	2.9
1,500	21	278	10.7	20	309	5.6	26	263	8.5	29	307	8.2	31	192	.6	30	310	5.6
2,000	18	281	13.3	16	315	5.8	26	270	10.9	29	300	9.7	30	257	1.2	27	302	8.1
2,500	11	277	13.3	15	316	6.5	25	269	13.6	27	298	11.5	30	273	2.9	25	294	9.4
3,000				15	309	7.2	25	273	16.0	25	285	14.1	28	289	4.6	22	294	10.0
4,000				13	309	10.3	23	279	18.1	23	276	16.9	26	285	8.1	17	300	12.9
5,000							20	276	19.5	19	280	19.4	25	289	10.2	15	305	17.8
6,000							19	281	21.9	16	289	24.5	20	297	11.2	11	293	20.1
8,000							12	289	26.8				12	275	13.7			
10,000																		

	St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)		
Surface	29	293	2.8	28	242	2.2	30	261	0.4	28	265	2.8	28	249	0.8	26	190	2.4
500	29	298	4.1	28	246	4.4	30	281	1.2	28	304	2.4	28	263	1.9	26	198	4.3
1,000	27	309	5.8	21	246	7.3	26	269	2.5	26	336	1.8	23	275	4.6	21	219	5.8
1,500	26	299	7.2	20	258	10.7	25	262	4.8	24	343	2.8	20	278	6.2	16	215	3.7
2,000	26	298	9.3	19	265	13.5	24	264	6.8	21	345	5.0	18	279	8.1	15	208	3.8
2,500	25	294	11.5	18	267	15.5	24	265	8.7	21	336	5.7	16	279	9.8	10	208	1.7
3,000	24	288	14.2	16	272	17.3	21	268	10.1	21	338	7.3	11	281	10.9			
4,000	23	290	16.9	16	283	21.0	21	263	13.3	20	326	8.2	10	280	17.0			
5,000	22	293	20.2	14	280	22.6	20	266	15.7	19	315	9.9						
6,000	19	296	22.8	14	273	25.2	18	271	18.0	19	305	11.0						
8,000							14	271	23.5	16	288	11.8						
10,000							10	290	27.0	10	279	12.8						

	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
Surface	24	193	2.4	26	273	2.0
500	--	---	----	26	255	5.7
1,000	24	209	4.0	26	262	8.7
1,500	23	230	5.5	24	266	11.7
2,000	19	242	4.9	22	263	12.7
2,500	17	255	5.8	22	269	13.8
3,000	12	294	3.6	20	274	15.2
4,000				18	174	20.5
5,000				10	272	22.9
6,000						
8,000						
10,000						

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

JANUARY 1951

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	56	1.6	31	141	2.6	31	331	0.8	31	137	2.1	31	100	1.2	31	266	3.5	31	233	1.2	31	299	0.4	31	50	1.0	27	248	3.4	31	278	2.2	31	269	1.7
500	--	---	----	--	---	----	--	---	----	31	154	6.0	31	181	3.7	31	275	6.8	29	230	4.5	31	260	6.1	--	---	----	27	246	4.9	30	259	5.2	29	272	3.1
1,000	--	---	----	31	196	5.1	31	297	5.3	31	173	5.0	30	218	3.5	31	284	7.9	29	244	6.6	31	269	8.5	--	---	----	27	248	7.6	29	258	6.6	29	281	4.7
1,500	--	---	----	31	241	6.9	31	296	7.1	31	201	4.9	29	248	4.9	31	282	10.3	29	259	7.3	31	273	9.7	31	50	1.0	26	261	10.9	28	265	7.9	29	286	6.6
2,000	31	287	3.9	31	264	8.2	31	295	8.9	31	224	4.8	29	251	7.0	31	278	12.2	29	262	9.1	31	274	10.4	31	194	.9	21	271	12.7	27	267	9.0	28	295	7.3
2,500	31	283	6.8	31	266	8.1	31	294	10.5	30	236	5.9	29	251	8.1	30	273	14.3	29	266	10.2	30	272	11.5	31	224	3.4	19	273	14.0	27	268	11.3	29	294	8.8
3,000	31	279	8.7	31	271	9.8	31	289	12.1	30	247	7.7	29	254	9.0	30	267	17.1	29	269	11.2	30	271	15.9	31	255	6.1	17	280	17.3	28	270	12.4	29	294	10.5
4,000	30	282	11.2	30	273	12.3	30	291	14.0	30	255	9.6	28	261	11.8	29	261	20.3	28	271	14.4	30	267	19.0	31	281	11.4	17	275	18.7	28	266	16.5	29	293	12.8
5,000	29	280	15.9	30	278	15.9	29	289	15.5	29	262	12.5	28	262	14.5	26	259	21.7	27	274	17.2	27	263	21.5	30	285	14.3	11	275	22.3	25	267	18.2	28	289	14.8
6,000	26	278	17.0	26	277	19.1	29	285	18.6	27	264	16.0	28	267	18.4	23	260	22.6	25	276	18.7	19	264	25.7	27	285	17.1				24	265	19.2	27	289	17.2
8,000	16	301	18.2	18	277	23.8	24	282	22.9	22	271	18.9	24	268	22.9	14	249	20.2	23	273	24.3				18	280	17.2				16	266	25.0	21	277	21.4
10,000	10	298	21.7	11	287	26.9	17	276	22.0	18	270	22.2	22	267	31.2	10	242	25.4	17	280	28.0				10	280	18.5				12	272	26.4	13	270	18.2
12,000							12	273	16.4	13	263	27.0	15	266	30.7				13	282	36.1															

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
Surface	31	326	0.2	31	171	1.2	31	55	1.4	31	301	2.3	29	213	1.8	31	207	0.1	29	97	0.9	31	330	1.9	31	39	1.0	31	89	2.8	31	287	1.3	31	350	0.9
500	31	216	4.2	30	174	1.6	31	94	3.5	31	270	7.9	29	219	5.9	31	285	2.1	27	300	0.3	--	---	----	31	130	1.2	30	62	6.5	31	283	3.1	31	2	3.8
1,000	30	239	6.4	30	187	2.8	31	99	3.5	30	276	9.2	29	231	9.5	31	292	3.5	27	250	3.2	31	326	2.0	31	210	2.1	30	62	6.4	31	297	5.2	31	353	4.4
1,500	29	249	8.8	30	222	5.8	31	99	1.7	29	270	11.3	27	249	11.6	31	290	5.2	26	272	5.9	31	299	7.1	31	243	5.2	30	62	5.3	31	291	7.3	31	345	5.6
2,000	27	256	10.9	30	240	8.7	31	330	.5	27	268	13.3	27	258	13.2	31	291	6.6	26	272	8.1	30	302	9.3	31	251	7.6	31	55	4.3	31	291	9.4	31	333	6.6
2,500	26	267	13.1	30	260	10.7	30	286	1.3	24	270	15.3	27	258	14.2	31	292	7.7	28	274	11.7	29	305	10.4	29	251	8.8	31	42	3.7	31	288	11.5	31	324	7.3
3,000	26	267	14.8	30	275	13.5	30	264	3.6	23	268	17.6	27	259	15.5	30	303	10.0	29	271	13.5	23	299	10.9	29	246	9.4	31	38	3.0	31	288	14.5	31	317	8.4
4,000	23	271	18.1	26	291	15.9	30	266	6.4	20	270	20.5	27	261	17.5	28	303	12.7	27	260	14.9	23	289	15.3	29	259	12.4	31	02	3.0	30	288	17.1	31	308	11.1
5,000	20	275	20.4	22	294	18.6	30	268	9.1	15	263	22.9	25	263	21.0	27	301	13.7	25	266	17.4	23	289	18.8	27	262	13.3	31	338	4.2	29	283	20.1	26	303	12.1
6,000	20	273	24.7	16	280	19.7	30	270	11.4	11	271	22.9	22	262	23.0	25	288	16.9	23	274	19.8	23	287	22.0	25	264	17.2	30	319	5.6	24	271	21.7	25	296	13.4
8,000	14	263	33.0	13	290	22.6	27	280	16.5				16	258	29.7	19	282	19.2	17	270	22.6	16	283	25.8	18	267	21.3	28	297	10.6	17	274	28.0	22	286	15.6
10,000							26	280	24.5				11	265	31.4	14	277	20.1	10	266	27.8	11	267	27.3	11	281	23.2	28	293	20.8	11	258	30.0	20	276	18.1
12,000							24	275	34.7																			25	281	23.6				16	279	17.9
14,000							13	267	26.3																			22	283	17.3				14	284	18.8
16,000							12	259	17.9																			17	290	10.0				12	289	13.2
18,000																												14	337	3.5				11	275	10.0

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
Surface	30	71	0.6	29	189	2.3	28	140	3.2
500	30	243	2.1	--	---	----	28	175	4.4
1,000	30	269	4.2	28	210	4.1	26	185	4.2
1,500	30	270	5.9	28	233	6.1	24	203	3.0
2,000	29	271	7.8	25	254	6.0	24	231	2.7
2,500	28	266	9.5	23	259	5.6	24	242	3.9
3,000	27	263	11.2	22	269	5.0	24	261	4.8
4,000	25	265	14.2	22	292	10.0	24	273	9.2
5,000	23	261	17.3	21	292	12.8	23	280	14.4
6,000	19	260	15.9	20	289	17.5	22	285	18.8
8,000	13	254	18.4	13	290	21.6	17	284	19.2
10,000							11	282	17.3

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30.-Solar radiation intensities, tabulated in langleys per minute.

JANUARY 1951

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
TABLE MOUNTAIN, CALIF.											
	Air mass										
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
January										Mb.	Mb.
5----	----	----	----	1.53	----	----	----	----	----		
6----	----	----	----	1.57	----	----	----	----	----		
7----	1.27	1.36	1.47	1.59	----	----	----	----	----		
9----	----	----	----	1.58	----	----	----	----	----		
23---	1.17	1.26	1.37	1.50	----	----	----	----	----		
24---	----	----	----	1.53	----	----	----	----	----		
25---	1.24	1.33	1.44	1.55	----	----	----	----	----		
Averages	1.23	1.32	1.43	1.55	----	----	----	----	----		
Departures	.00	.00	+.02	+.01	----	----	----	----	----		
LINCOLN, NEBR.											
	Air mass										
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
January										Mb.	Mb.
6----	----	----	----	----	----	----	1.13	1.02	0.92	1.0	1.4
8----	----	----	----	----	----	----	1.22	1.14	1.03	1.1	3.2
10---	----	----	----	----	----	----	1.24	1.11	.98	2.9	3.3
12---	0.66	0.79	0.94	----	----	----	.94	.81	.64	3.2	4.2
17---	----	----	----	----	----	----	1.14	1.01	.86	4.2	4.4
18---	----	----	----	----	----	----	1.09	1.01	.88	4.6	5.1
23---	.92	1.02	1.13	----	----	----	----	1.01	.92	3.7	3.8
24---	----	----	----	----	----	1.24	1.09	.98	.89	2.5	2.6
Averages	.79	.91	1.04	----	----	1.24	1.12	1.01	.89		
Departures	-.14	-.13	-.14	----	----	-.15	-.06	-.04	-.04		
MADISON, WIS.											
	Air mass										
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
January										Mb.	Mb.
8----	0.92	1.04	1.16	----	----	----	----	----	----	0.8	1.6
11---	.96	1.07	1.22	----	----	----	1.19	----	----	1.8	3.0
30---	.91	1.04	----	----	----	----	----	----	----	.1	.3
Averages	.93	1.05	1.19	----	----	----	1.19	----	----		
Departures	+.05	+.04	+.02	----	----	----	+.04	----	----		
BOSTON, MASS.											
	Air mass										
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
January										Mb.	Mb.
5----	1.03	1.14	1.25	----	----	----	1.18	1.01	0.86		
9----	.78	.85	1.09	----	----	----	1.22	1.01	.90		
10---	.68	.81	1.01	----	----	----	----	----	----		
22---	.86	.96	1.19	----	----	----	1.30	1.16	1.02		
Averages	.84	.94	1.14	----	----	----	1.23	1.06	.93		
Departures	+.05	+.08	+.14	----	----	----	+.20	+.14	+.13		

* Extrapolated

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
TACUBAYA, D. D., MEXICO											
	Air mass										
	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
January										Mb.	Mb.
1----	----	----	0.85	----	----	0.84	----	0.63	----	7.3	6.4
2----	----	----	----	0.94	----	----	0.95	.62	0.65	8.4	7.1
3----	0.76	0.69	.80	.96	----	.85	----	----	----	5.6	6.1
4----	----	----	----	.91	----	.59	.46	.28	.24	5.9	3.2
5----	.06	.45	.60	.57	----	.52	.33	.18	.04	6.4	6.7
6----	.35	.41	.53	.85	----	----	.47	----	----	7.6	8.5
8----	.22	.28	.45	.67	----	.66	----	----	----	7.1	9.3
9----	.50	.56	.73	.91	----	----	----	----	----	7.3	9.6
10---	.46	.45	.57	.78	----	.73	.43	.21	----	7.4	9.1
11---	.47	.55	.67	1.05	----	----	----	----	----	7.2	8.8
12---	.75	.82	1.10	.76	----	----	----	----	----	7.1	9.3
13---	.41	.73	.77	.86	----	.81	.55	.59	.60	6.7	5.6
15---	----	----	----	.97	----	.99	.75	.61	.45	6.9	4.5
16---	.61	.45	.66	.91	----	.68	.45	.29	.15	4.1	6.4
17---	.46	.65	.79	.96	----	.72	.38	.14	.09	6.1	6.3
18---	.59	.72	.64	.82	----	.64	.36	----	.12	6.0	6.3
19---	.22	.65	.87	1.00	----	1.12	----	----	----	6.4	6.3
20---	.60	.65	.77	1.07	----	.75	.54	.35	.13	6.1	6.4
22---	.60	.59	.79	.83	----	1.01	.70	----	----	8.0	9.9
23---	.42	.43	.60	.84	----	----	----	----	----	7.7	7.7
24---	.23	.91	.82	.95	----	.93	.86	----	----	5.7	8.4
25---	----	----	----	1.04	----	----	.69	----	----	8.0	8.4
26---	.65	.76	.86	1.10	----	1.11	.90	.68	.65	5.9	5.7
27---	.53	.50	.55	.95	----	.72	----	----	----	6.1	8.5
29---	.51	.74	.72	1.14	----	----	----	----	----	7.3	8.8
30---	.44	.46	.66	.82	----	.71	.48	.42	.32	7.1	8.3
31---	.62	.78	.96	1.20	----	.88	.83	----	.77	7.2	7.6
Averages	.48	.60	.73	.92	----	.80	.60	.42	.35		
Departures	----	----	----	----	----	----	----	----	----		
BLUE HILL, MASS.											
	Air mass										
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
January										Mb.	Mb.
1----	0.91	1.01	1.13	----	----	----	1.12	1.01	0.91	2.9	3.5
5----	1.06	1.15	1.28	----	----	----	1.26	1.12	1.01	2.3	2.0
9----	1.03	1.12	1.22	----	----	----	1.19	1.05	.94	1.1	2.1
10---	.79	.91	1.05	----	----	----	----	----	----	2.3	3.3
12---	----	----	.77	----	----	----	----	----	----	5.0	3.5
13---	.96	1.08	1.20	----	----	----	1.29	1.24	1.08	3.1	2.0
14---	1.08	1.16	----	----	----	----	----	----	----	2.1	2.5
16---	.71	----	----	----	----	----	----	----	----	3.5	3.0
18---	.70	.84	1.00	----	----	----	----	----	----	4.0	5.4
19---	----	----	----	----	----	----	.88	.74	.62	6.4	8.0
22---	1.06	1.15	1.27	----	----	----	1.27	1.16	1.05	1.5	.9
30---	.62	.75	----	----	----	----	----	----	----	2.4	2.3
Averages	.89	1.02	1.12	----	----	----	1.17	1.05	.94		
Departures	-.05	-.02	-.03	----	----	----	.00	+.02	+.01		
	RATIOS, BOSTON/BLUE HILL ON COMPARABLE DATES										
	0.85	0.87	0.94	----	----	----	0.99	0.95	0.93		
ALBUQUERQUE, NEW MEXICO											
	Air mass										
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
	Recorder inoperative.										

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 33 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

ERRATUM: In Monthly Weather Review of March 1947, in Table 1, under "Solar Radiation and Sunspot Data for March 1947", the data appearing under Table Mountain, California, are those for Climax, Colorado, and the data under Climax, Colorado, are those for Table Mountain, California.

SOLAR RADIATION DATA

JANUARY 1951

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	1	2	3	4	5	6	7	Average	8	9	10	11	12	13	14	Average	15	16	17	18	19	20	21	Average
Langleys	510	341	33	28	537	111	25	226	314	582	479	133	293	559	296	379	39	262	156	334	373	416	92	239
Date	22	23	24	25	26	27	28	Average																
Langleys	593	213	26	53	113	116	130	178																

Table 31b*.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	1	2	3	4	5	6	7	Average	8	9	10	11	12	13	14	Average	15	16	17	18	19	20	21	Average
Langleys	60	47	22	7	42	43	17	34	65	66	59	56	63	59	70	62	16	51	51	37	39	41	29	38
Date	22	23	24	25	26	27	28	Average																
Langleys	43	49	10	30	38	43	33	35																

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	1	2	3	4	5	6	7	Average	8	9	10	11	12	13	14	Average	15	16	17	18	19	20	21	Average
Langleys	56	74	47	32	44	100	23	54	94	49	57	90	91	48	110	77	32	106	117	69	68	72	67	76
Date	22	23	24	25	26	27	28	Average																
Langleys	46	110	24	72	111	113	89	81																

Note.-Langley is the unit used to denote one gram calorie per square centimeter.
*Beginning with January 1951, Table 32 has been changed to Table 31b.

Beginning with this issue, a new table (No. 31c), "Daily Totals and Average Daily Totals by Weeks of Diffuse (Sky) Radiation Received on a Horizontal Surface at Blue Hill, Mass", is being added. This table will show the values of diffuse (sky) radiation only. In the recording of these data, the direct solar radiation is shaded from the receiving surface of the pyrheliometer by an occulting ring having a radius of twenty inches. This ring is so mounted that its plane is in the plane of the apparent path of the sun in its diurnal march across the sky. The ring is adjusted, without changing the position of its plane in space, at intervals varying from 2 to 7 or 8 days, to allow for the seasonal change in the sun's declination and is checked daily to make certain that it is shading properly. The pipe, of which the ring is constructed, has a diameter of 2 inches, thus the distance/diameter ratio (10 to 1) generally used in previous diffuse radiation measurements is maintained.

Diffuse radiation values have been recorded at Blue Hill since 1945 and it is planned to publish a paper containing these data for the period 1945 through 1950 in the near future.

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. JANUARY 1951

1951	Aklavik, MacKenzie	Albany, N.Y.	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Bismarck, N. Dak.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Texas	Canton Island, Pacific Area	Caribou, Me.	Charleston, S.C.	Cleveland, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Texas	Ely, Nevada	Fairbanks, Alaska	Ft. Worth, Texas	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Lake, Colo.	Great Falls, Mont.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N.Y.	Lake Charles, La.
January 1----	1		92	239	345	284		223	45	164	(306)	637		(172)	227	208	132	221	59	219		7	60	217	270	115			266	262	356		---	---	40
January 2----	2		299	131	283	30		155	23	141	209	478		275	56	93	12	148	40	148		5	162	215	239	157			121	285	366		---	107	86
January 3----	1		332	52	160	129		52	133	38	425	59		91	26	46	2	74	57	357		5	358	99	194	117			120	153	239		181	25	244
January 4----	1		329	29	286	339		35	67	40	395	715		209	41	189	62	41	119	364		4	341	140	101	124			338	120	327		312	57	(344)
January 5----	1		329	225	(254)	327		228	144	220	364	670		327	115	168	24	227	120	369		5	334	181	252	161			332	304	404		313	73	364
January 6----	2		347	74	(245)	248		117	219	85	195	677		101	20	254	25	92	94	375		3	158	186	263	159			236	232	463		327	25	(244)
January 7----	1		345	37	154	62		25	189	17	383	702		147	112	178	106	12	72	384		(3)	377	113	230	182			60	97	474		327	37	364
Averages------	1		296	112	(247)	203		119	117	101	325	562		(189)	85	162	52	117	80	317		(5)	256	164	221	145			210	208	376		280	54	241
Departures----	00		+3	-18	-17	---		-10	+15	+12	---	---		---	---	00	-28	-2	-1	-18		-1	-7	+12	-34	---			---	---	-3		-4	-44	+6
January 8----	T		333	202	393	340		178	66	147	438	665		333	110	64	120	126	99	296		6	379	43	371	162			350	238	501		323	148	378
January 9----	1		332	216	384	326		242	162	207	353	586		351	224	38	153	233	108	385		7	240	39	---	173			337	298	483		270	197	244
January 10----	2		330	197	367	250		219	112	188	298	649		343	80	99	73	210	96	395		(5)	375	132	331	177			287	324	445		156	131	243
January 11----	1		165	60	387	330		127	100	78	192	665		233	45	153	84	83	80	373		9	311	69	228	177			343	175	453		200	32	300
January 12----	1		180	159	332	159		187	75	150	222	669		314	104	259	175	172	114	370		6	170	211	353	190			226	274	383		205	139	255
January 13----	1		303	---	339	78		253	107	212	353	602		201	86	225	55	227	114	317		9	(143)	270	344	176			166	287	434		336	76	92
January 14----	1		350	---	252	165		186	52	143	302	689		207	30	198	3	171	86	404		11	199	275	357	170			193	98	286		340	65	205
Averages------	1		285	167	351	235		199	96	161	308	646		283	97	148	95	174	100	363		(8)	(260)	148	331	175			272	242	426		261	113	245
Departures----	-1		-18	+20	+28	---		+42	-17	+40	---	---		---	---	-39	-4	+19	+5	+2		-1	-26	-16	+49	---			---	---	+6		-19	-3	-19
January 15----	4		294	---	369	338		40	128	40	449	604		(332)	73	45	90	28	34	394		14	377	201	281	127			346	182	374		321	40	387
January 16----	3		319	---	412	368		178	149	175	439	648		370	157	147	115	197	80	363		9	383	247	---	182			369	308	467		286	111	389
January 17----	4		349	137	345	315		147	202	117	407	668		355	200	82	86	156	100	405		9	328	216	382	101			331	326	461		329	165	277
January 18----	6		363	131	362	149		189	142	153	442	696		286	189	112	88	156	123	407		16	379	89	369	96			201	203	382		318	44	345
January 19----	6		356	168	224	197		205	109	158	401	636		255	137	227	141	181	125	404		16	385	259	357	134			202	295	500		357	139	355
January 20----	6		359	147	381	266		227	193	193	364	726		348	86	230	2	162	134	406		14	388	263	270	131			310	314	509		319	186	200
January 21----	14		365	119	303	372		89	79	88	157	715		307	124	61	156	106	96	413		15	344	261	322	147			345	246	462		299	46	316
Averages------	6		344	140	342	286		154	143	132	380	670		(322)	138	129	97	141	99	399		13	369	220	331	131			301	268	451		319	104	324
Departures----	-4		+19	-7	+6	---		-5	+8	+12	---	---		---	---	-78	-18	-5	+1	+13		00	+41	+25	+67	---			---	---	+13		+8	-15	+18
January 22----	18		301	272	384	---		284	98	249	167	688		280	190	101	86	277	97	413		13	291	195	195	155			356	309	145		268	181	394
January 23----	23		358	87	123	116		169	52	136	361	(665)		72	54	65	21	180	92	398		12	326	147	---	200			116	301	388		341	77	230
January 24----	22		340	20	42	360		28	141	32	411	672		92	267	83	127	22	69	418		(31)	386	179	185	118			333	267	431		359	156	401
January 25----	23		362	177	370	383		81	126	66	434	713		358	137	73	65	39	74	410		40	355	82	331	101			381	42	479		370	115	370
January 26----	28		373	208	421	387		145	236	121	421	714		382	215	104	121	60	76	403		38	395	29	393	116			390	311	513		353	112	399
January 27----	29		333	110	416	381		159	229	117	296	654		386	128	86	150	99	131	286		35	354	95	364	249			373	357	505		342	95	327
January 28----	33		230	103	401	252		135	219	110	217	(705)		341	30	119	82	129	115	360		16	82	233	---	264			284	316	509		373	35	206
Averages------	25		328	140	308	313		143	157	119	269	(687)		273	146	90	93	115	93	384		(26)	313	137	294	172			319	272	424		344	110	332
Departures----	+7		+2	+1	-12	---		-27	-18	-8	---	---		---	---	-135	-24	-27	-16	-8		+3	+36	-76	---	---			---	---	-18		-2	-25	+13
Accumulated Departures January 1 to 28, 1951	+14		+42	-28	+35	---		00	-84	+392	---	---		---	---	-1764	-518	-105	-77	-77		+7	+308	-385	---	---			---	---	-14		-119	-609	+126

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. (Continued) JANUARY 1951

1951	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Lynn, Mass.	Madison, Wis.	Medford, Ore.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Pearl Harbor, T.H.	Phoenix, Ariz.	Portland, Me.	Put-in-Bay, Ohio	Raleigh, N.C.	Rapid City, S. Dak.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Sayville, N.Y.	Seabrook, N.J.	Seattle (U. of W.), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Toronto, Ontario	Upton, N.Y.	Washington, D.C.	Winnipeg, Manitoba
January 1---		281	100	195	143	150	154	206	186	58	220		121	388	333		224	236	217	284	121	225	317		235	218	26	90	232	39	122	230	(227)	106
January 2---		211	142	140	39	58	33	152	146	---	63		23	351	357		47	259	213	180	97	149	316		184	192	50	58	99	43	16	177	140	107
January 3---		213	200	56	48	159	19	96	102	34	86		32	304	335		38	136	118	254	117	152	248		116	135	28	116	52	307	3	135	134	90
January 4---		251	270	32	114	83	282	45	79	96	298		33	384	344		127	271	104	178	117	91	82		63	117	29	107	65	277	40	51	192	138
January 5---		274	129	199	62	116	276	213	142	170	267		131	325	343		134	317	198	262	187	135	325		179	229	68	70	85	272	97	167	238	134
January 6---		297	226	84	232	197	237	106	171	174	(166)		94	449	366		46	172	250	281	248	255	327		160	184	145	165	73	251	40	148	222	148
January 7---		298	219	22	246	64	68	10	24	36	53		143	469	383		113	38	215	298	228	245	314		7	31	37	150	25	308	73	7	32	146
Averages-----		261	184	104	126	118	153	118	122	95	(165)		82	382	352		104	204	188	248	159	179	276		135	158	55	108	90	214	56	131	(169)	124
Departures---		+6	+14	-15	-2	+16	+45	-10	+9	---	-23		-23	-1	+20		+14	---	+19	+2	-2	+27	-5		-10	00	---	+10	-6	---	-10	-14	+11	+3
January 8---		258	290	217	248	105	245	192	258	128	296		234	412	369		216	350	179	283	216	102	290		235	211	85	59	168	302	119	(189)	205	143
January 9---		---	191	193	207	95	284	235	169	51	304		128	459	367		242	353	156	277	170	126	249		230	247	52	107	229	207	136	218	269	142
January 10---		194	263	163	215	136	17	213	172	59	108		93	467	371		71	318	202	76	219	126	284		231	233	58	71	212	308	91	199	(220)	154
January 11---		224	193	85	256	110	246	96	76	72	269		51	444	247		154	268	122	102	245	171	126		89	81	67	125	41	146	62	(73)	99	154
January 12---		183	248	126	214	123	49	225	255	66	48		147	372	226		205	171	226	243	213	219	345		244	205	32	66	176	248	112	218	213	135
January 13---		304	134	207	63	84	20	241	220	31	7		136	411	309		93	213	88	290	92	124	327		235	224	66	81	194	69	126	204	222	74
January 14---		305	264	134	147	121	38	162	85	20	25		100	280	375		29	49	159	295	97	194	335		113	47	28	92	31	229	28	106	20	166
Averages-----		245	226	161	193	111	128	195	176	61	151		127	406	323		144	246	162	224	179	152	280		196	178	56	86	150	216	96	(172)	(178)	138
Departures---		-8	+44	+22	+56	+4	-5	+37	+48	---	-15		+8	+9	-21		+7	---	-4	-25	+5	+11	-1		+21	-4	---	-19	+12	---	+8	+15	+26	+1
January 15---		295	277	34	134	123	141	47	140	---	138		94	175	388		148	272	163	300	161	82	328		100	205	108	131	99	301	127	60	248	161
January 16---		174	228	170	180	61	289	193	184	25	294		216	469	334		175	304	92	139	130	100	357		221	202	23	69	162	194	194	213	220	114
January 17---		281	258	119	173	22	199	183	193	---	245		78	391	381		235	318	94	303	217	155	154		214	253	72	187	234	186	130	(202)	228	92
January 18---		307	266	168	161	104	150	132	97	51	36		212	354	384		195	202	221	105	186	167	177		107	98	---	190	107	304	32	95	(203)	173
January 19---		240	153	149	177	199	253	194	162	147	201		121	494	381		99	306	94	298	111	148	337		175	253	---	140	201	319	139	160	263	129
January 20---		256	186	181	37	55	183	112	---	21	247		44	484	379		135	313	226	307	184	---	361		232	256	57	178	230	319	23	214	268	186
January 21---		280	293	89	267	52	141	167	173	140	222		200	388	388		138	303	175	252	256	93	307		145	221	86	95	63	366	208	130	235	182
Averages-----		262	237	131	161	88	194	147	158	77	198		138	394	378		161	288	152	243	178	124	289		171	212	69	141	157	284	122	(153)	(238)	148
Departures---		-9	+48	-5	+7	-16	+43	-8	+32	---	+13		-10	-13	+13		+22	---	-14	-36	-8	-45	-9		+6	+23	---	+5	+21	---	+19	+6	+80	+3
January 22---		288	208	238	70	117	242	281	261	116	327		239	186	369		194	353	153	248	143	78	348		(291)	300	108	222	275	264	487	270	292	45
January 23---		316	273	142	201	108	23	134	75	68	104		78	437	388		40	123	250	308	187	142	366		(86)	153	21	133	64	318	73	90	86	138
January 24---		319	287	26	208	56	252	20	64	79	275		139	418	396		230	54	233	308	239	176	374		41	97	82	103	174	265	194	45	124	137
January 25---		332	160	70	265	126	90	36	146	23	229		216	510	407		146	335	234	314	254	263	365		87	145	25	88	157	301	125	62	137	132
January 26---		322	239	133	124	116	237	102	(187)	143	340		181	496	355		231	341	76	259	112	106	372		242	181	132	172	128	313	135	210	202	125
January 27---		308	249	125	238	168	32	87	(41)	187	21		273	504	348		159	311	161	84	225	218	201		39	109	154	256	93	122	148	(31)	145	191
January 28---		327	256	124	162	220	18	109	45	245	50		182	495	398		68	274	274	62	290	251	313		54	78	220	261	17	192	110	54	140	238
Averages-----		316	239	122	181	130	128	110	(117)	123	192		187	435	380		153	256	197	226	207	176	334		(120)	152	106	176	130	254	131	(109)	161	144
Departures---		+12	+21	-11	+2	-14	-36	-50	-34	---	+20		+15	+6	+14		-2	---	-10	-29	-12	+13	+12		-12	-13	---	-6	-23	---	+16	-16	-15	-21

Accumulated Departures January 1 to 28, 1951

	Lander, Wyo.	Las Vegas, Nev.	Lincoln, Nebr.	Lynn, Mass.	Madison, Wis.	Medford, Ore.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Oklahoma City, Okla.	Ottawa, Ontario	Pearl Harbor, T.H.	Phoenix, Ariz.	Portland, Me.	Put-in-Bay, Ohio	Raleigh, N.C.	Rapid City, S. Dak.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Sayville, N.Y.	Seabrook, N.J.	Seattle (U. of W.), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Toronto, Ontario	Upton, N.Y.	Washington, D.C.	Winnipeg, Manitoba
		+7	+889	-63	+441	-70	+329	-217	+385	---	-35		-70	+7	+182		+287	---	-63	-616	-119	+42	-21		+35	+42	---	-70	+28	---	+231	-63	+714	-98

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

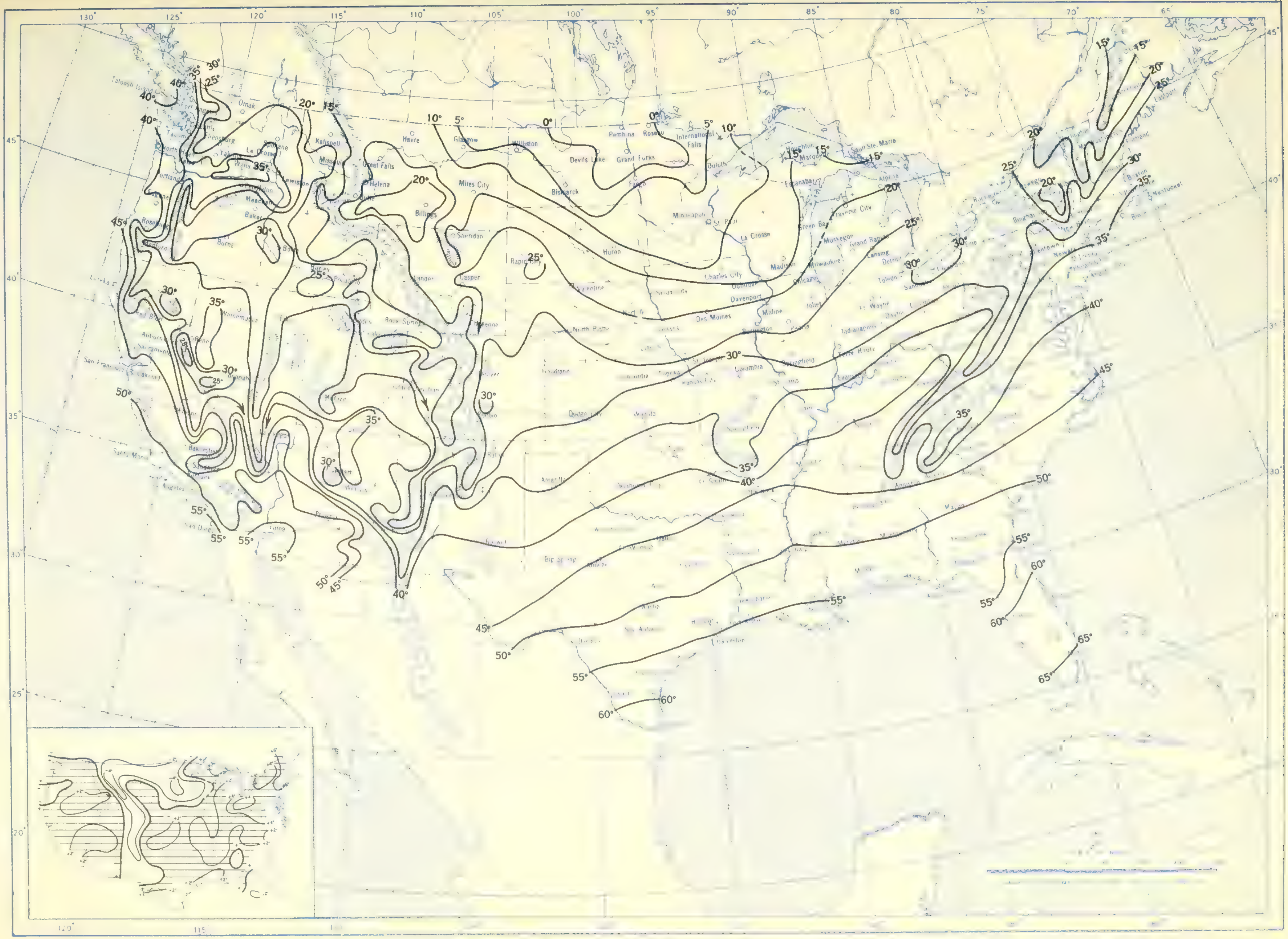
Beginning with this issue, two new stations are being added to Table 33:

1. Atlanta, Georgia: Latitude 33° 39' N; longitude 84° 25' W; elevation 303 meters; Eppley pyrheliometer and a Brown integrating potentiometer; exposure is excellent; smoke from industrial portion of Atlanta 8 miles to north causes slight atmospheric pollution; equipment located at Weather Bureau Office, Municipal Airport, Atlanta.

2. Canton Island, Pacific Area (Phoenix Group): Latitude 2° 46' S; longitude 171° 43' W; elevation 8 meters; operated by Weather Bureau. This is the southernmost station in our solar radiation network.

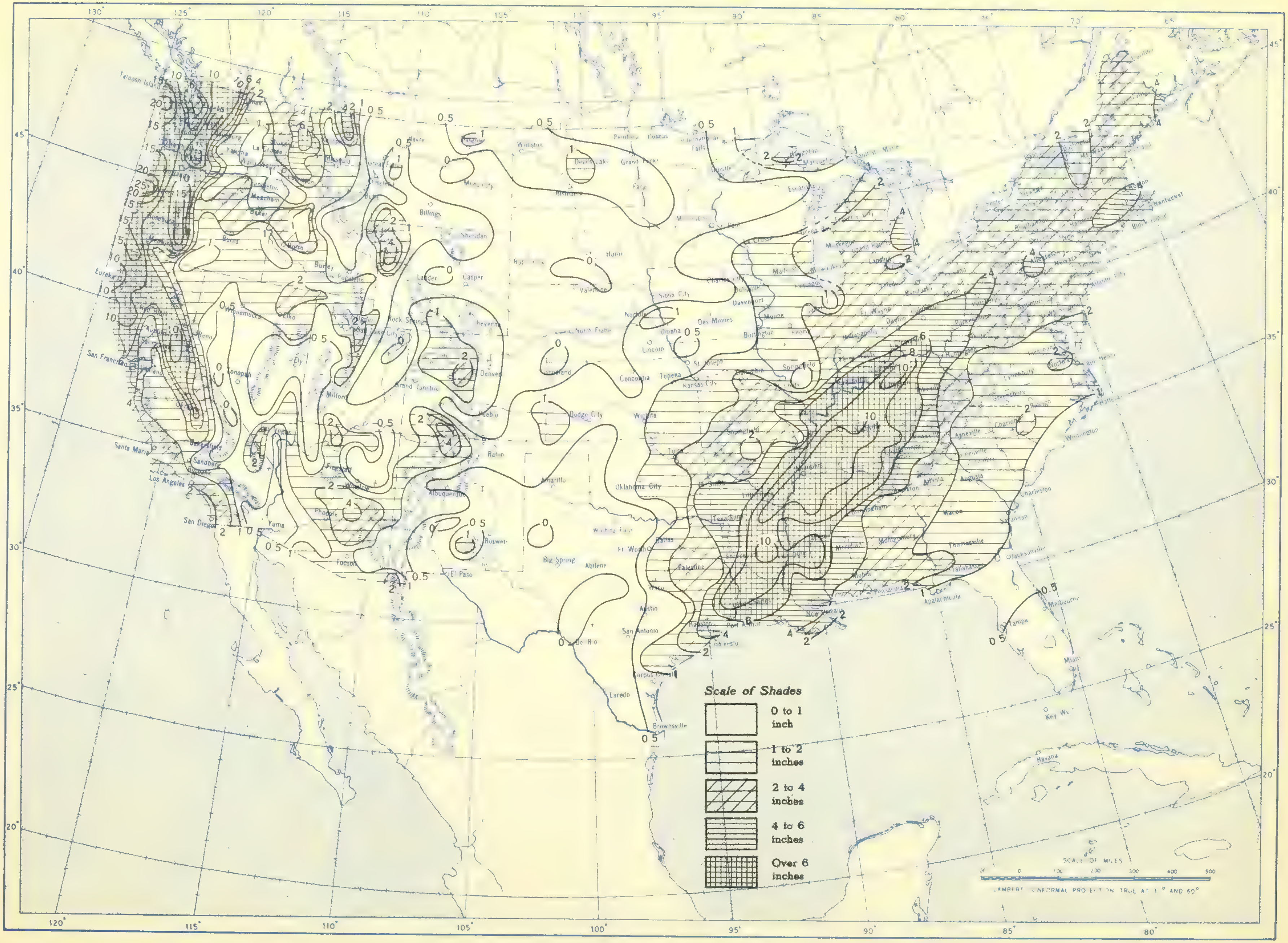
W.B.O., Washington, D.C.---5/18/51---2200

Chart I. Average Temperature (°F.) at Surface, January 1951. Inset: Departure of Average Temperature from Normal (°F.), January 1951.



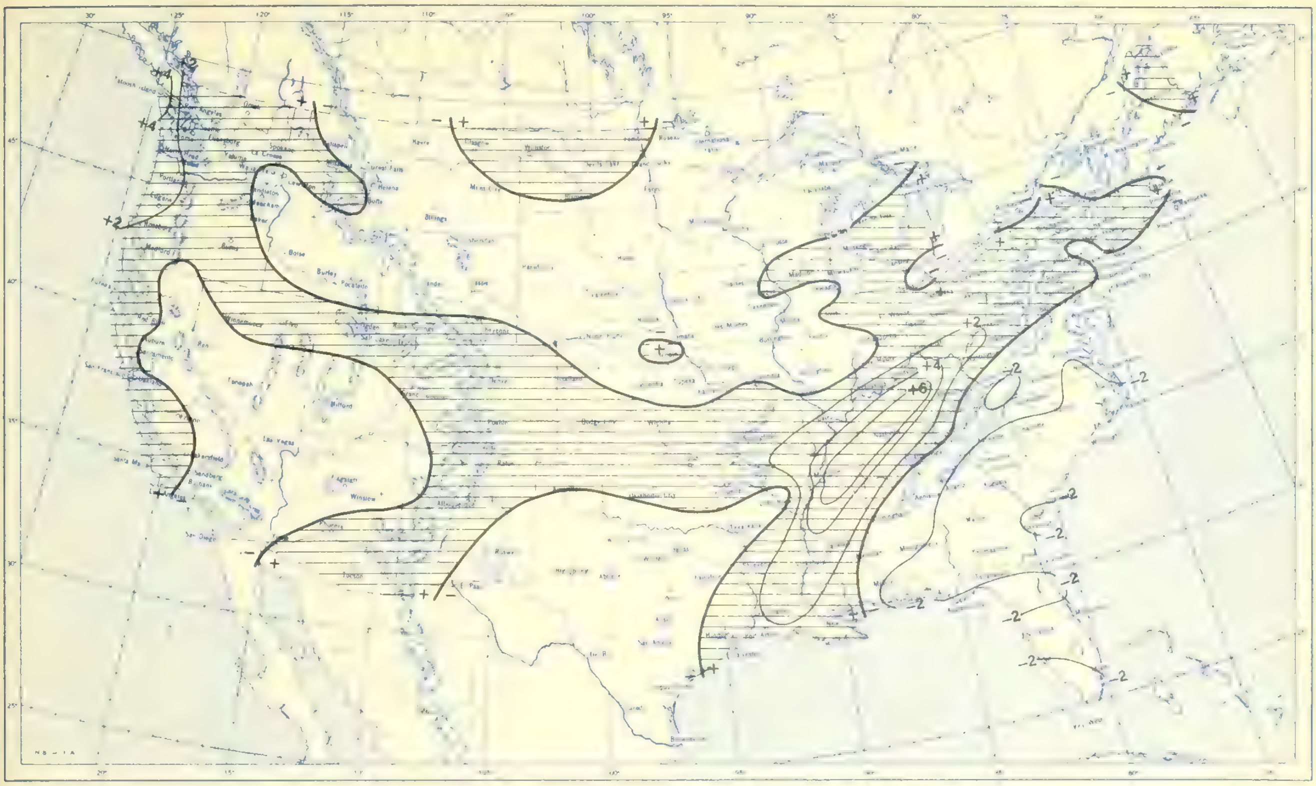
Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), January 1951.

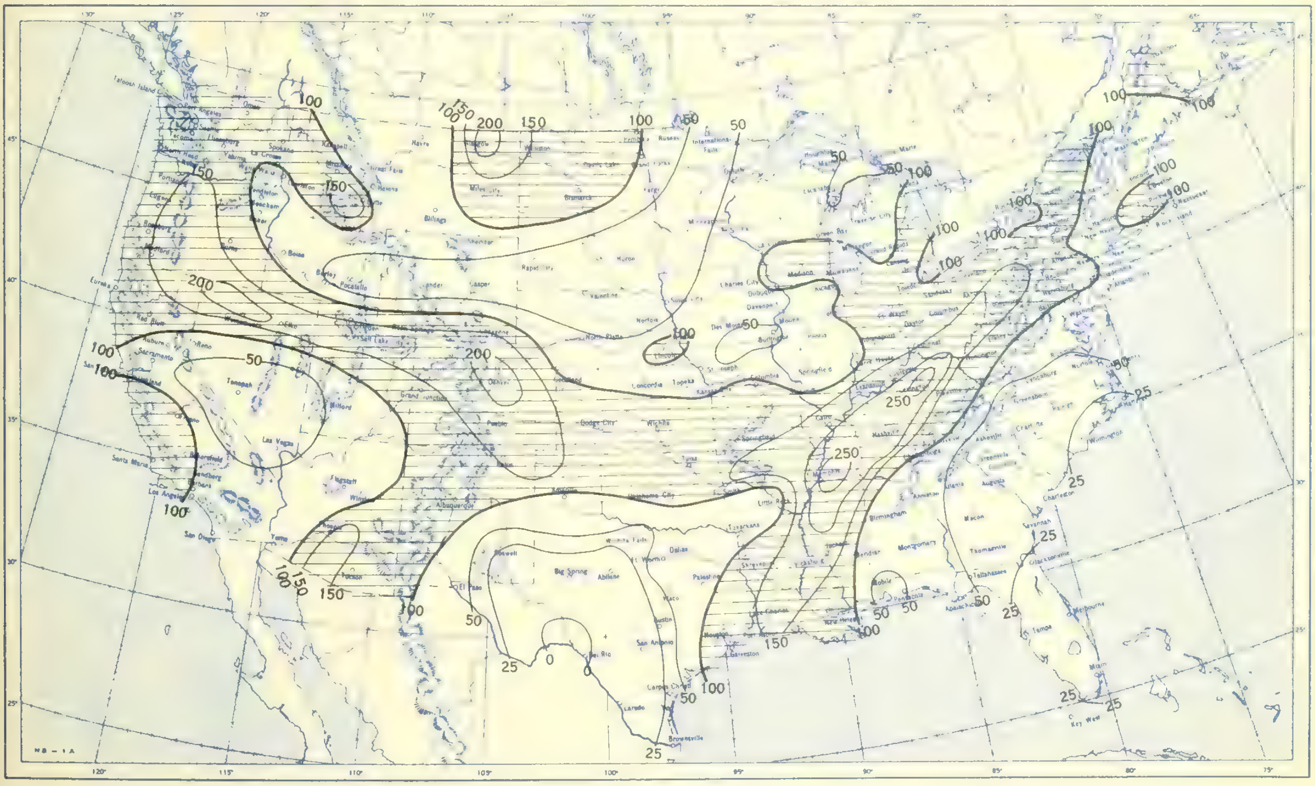


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), January 1951.

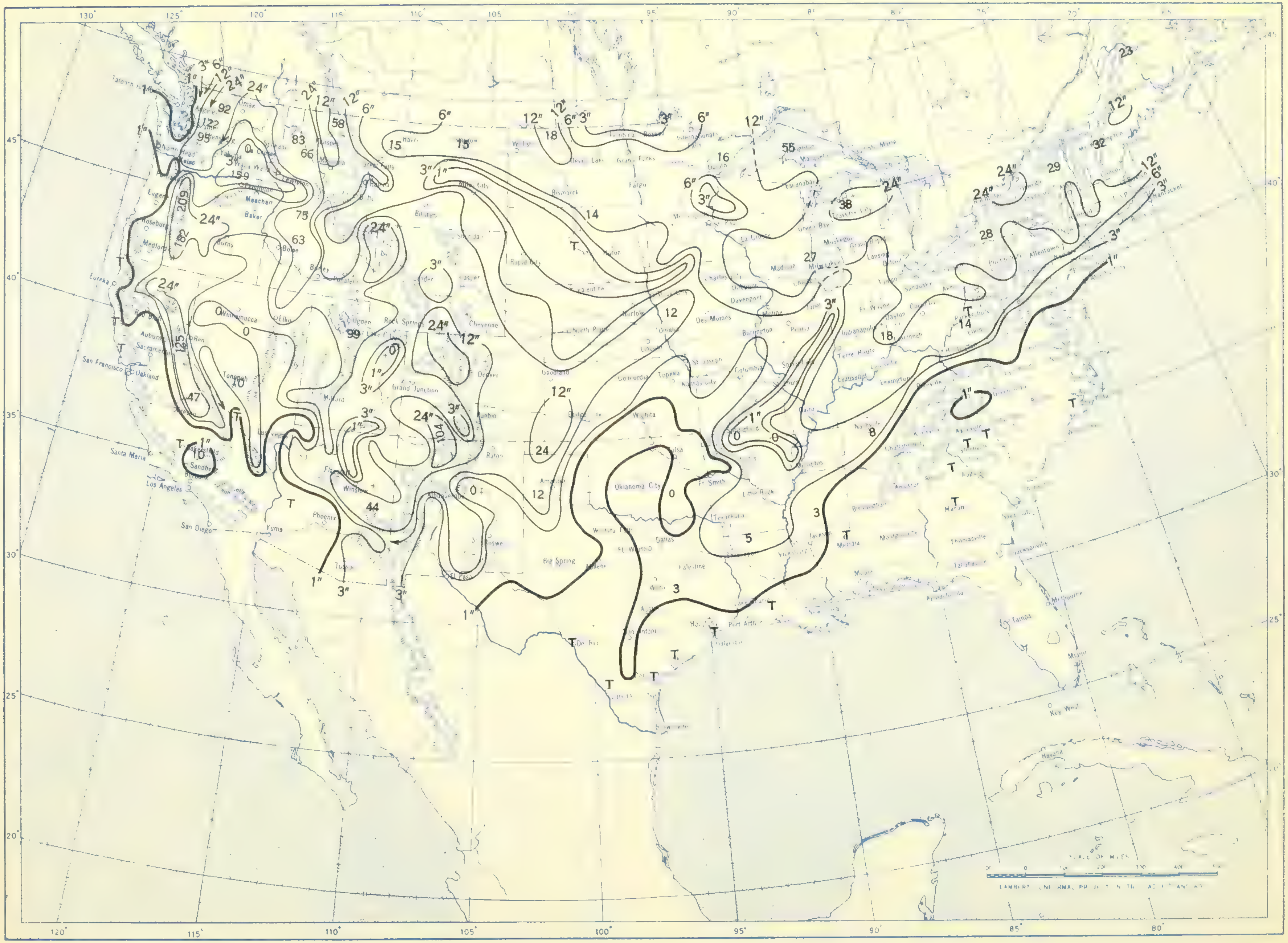


B. Percentage of Normal Precipitation, January 1951.



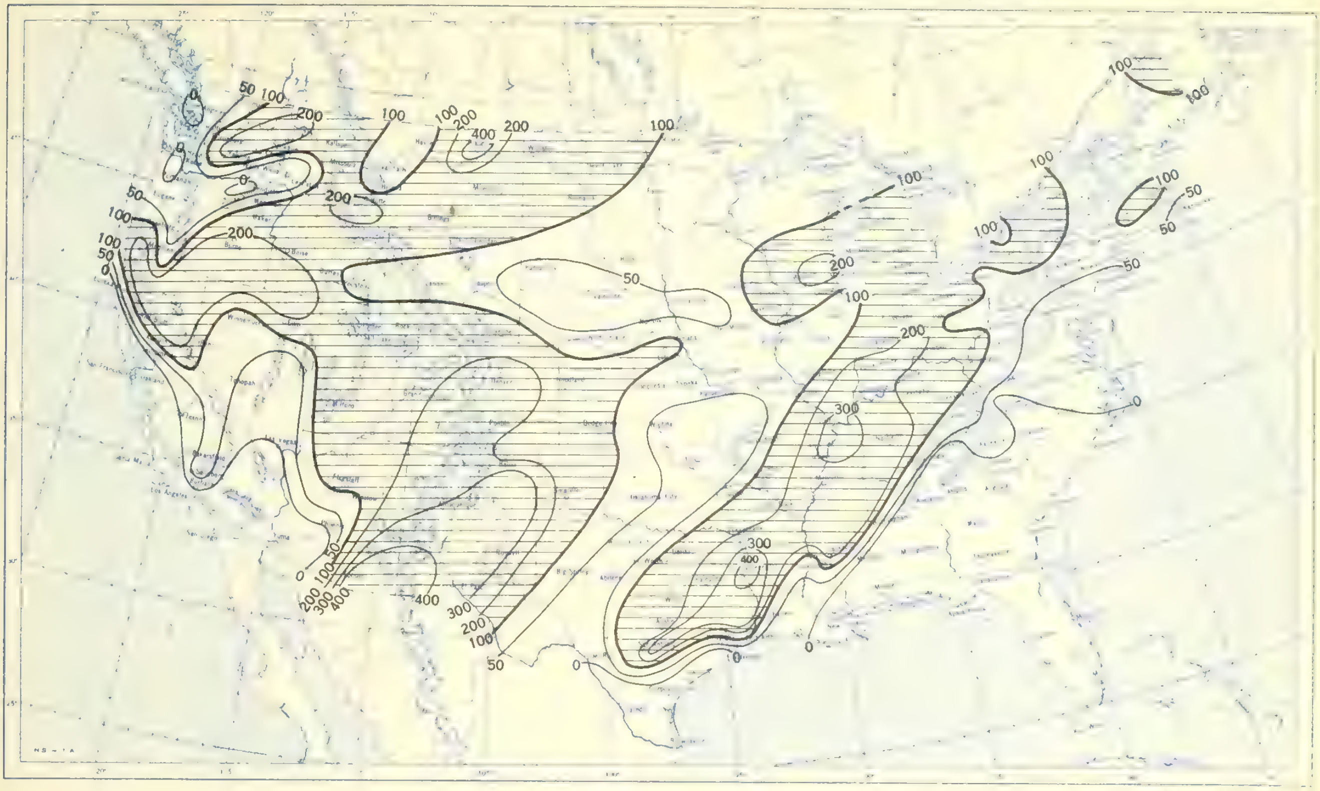
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), January 1951.

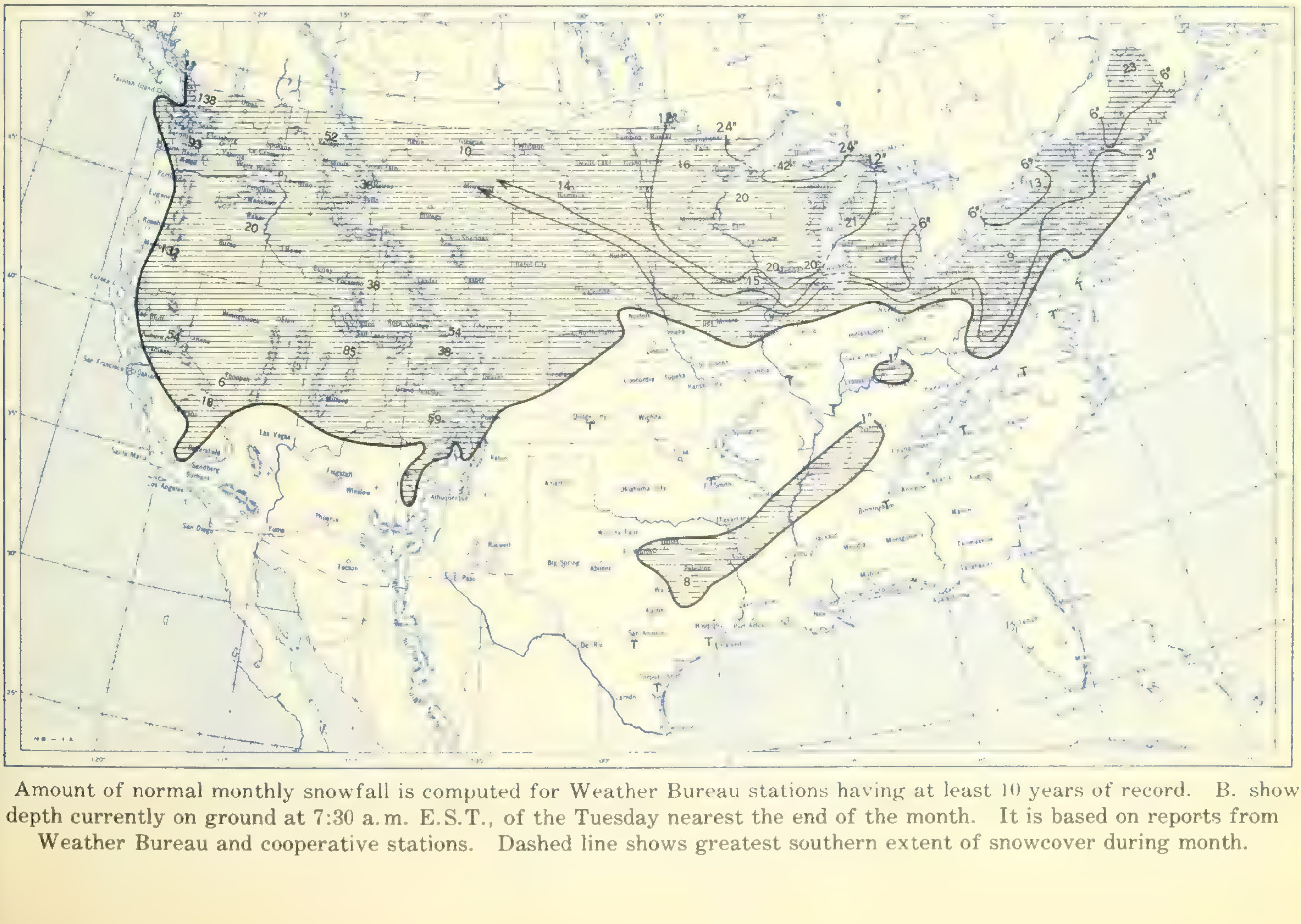


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, January 1951.

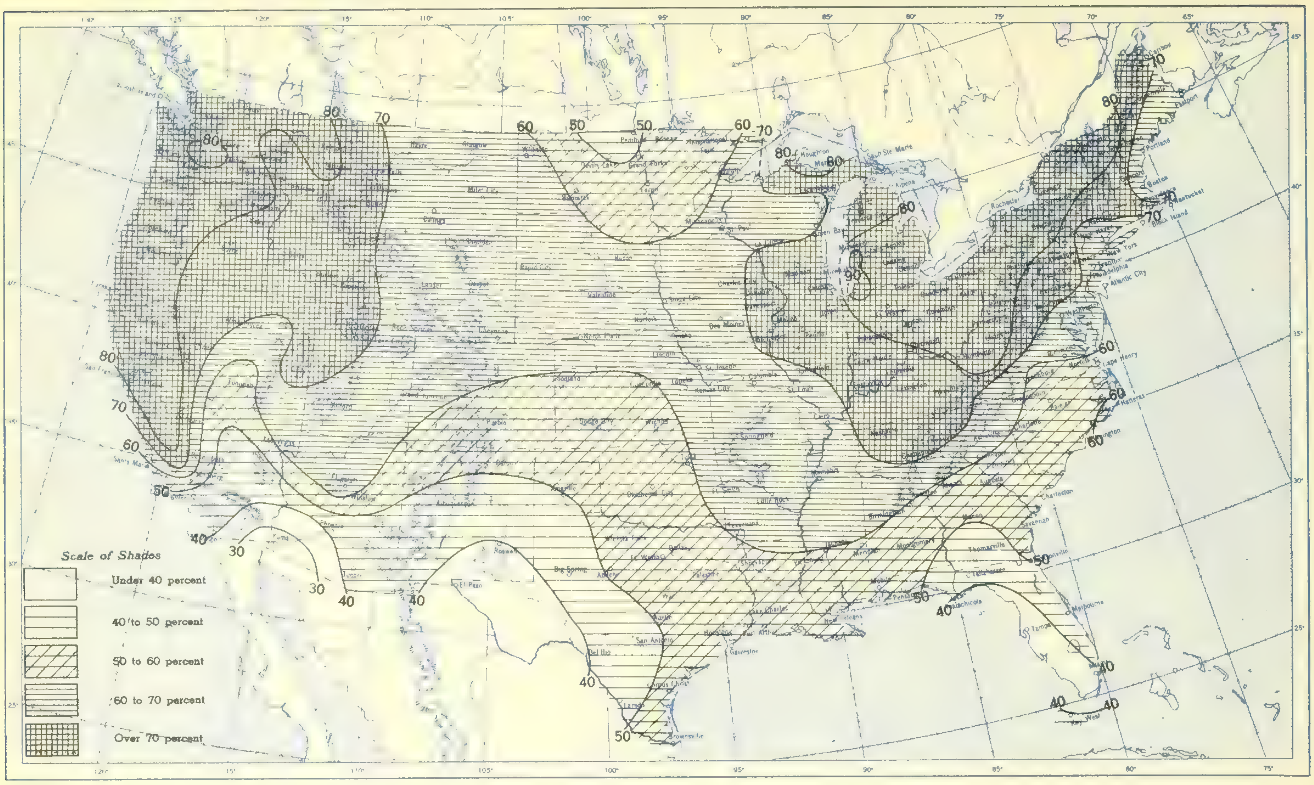


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., January 30, 1951.

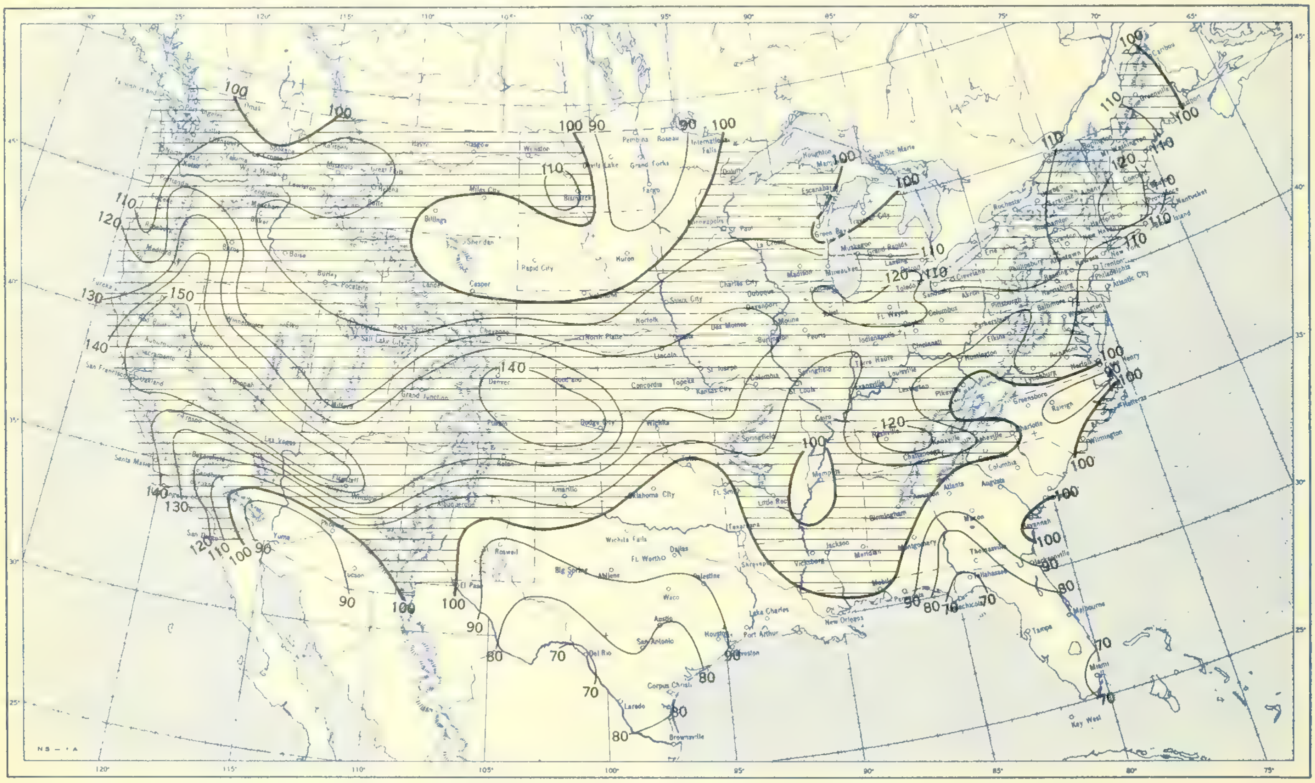


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record. B. shows depth currently on ground at 7:30 a.m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, January 1951.

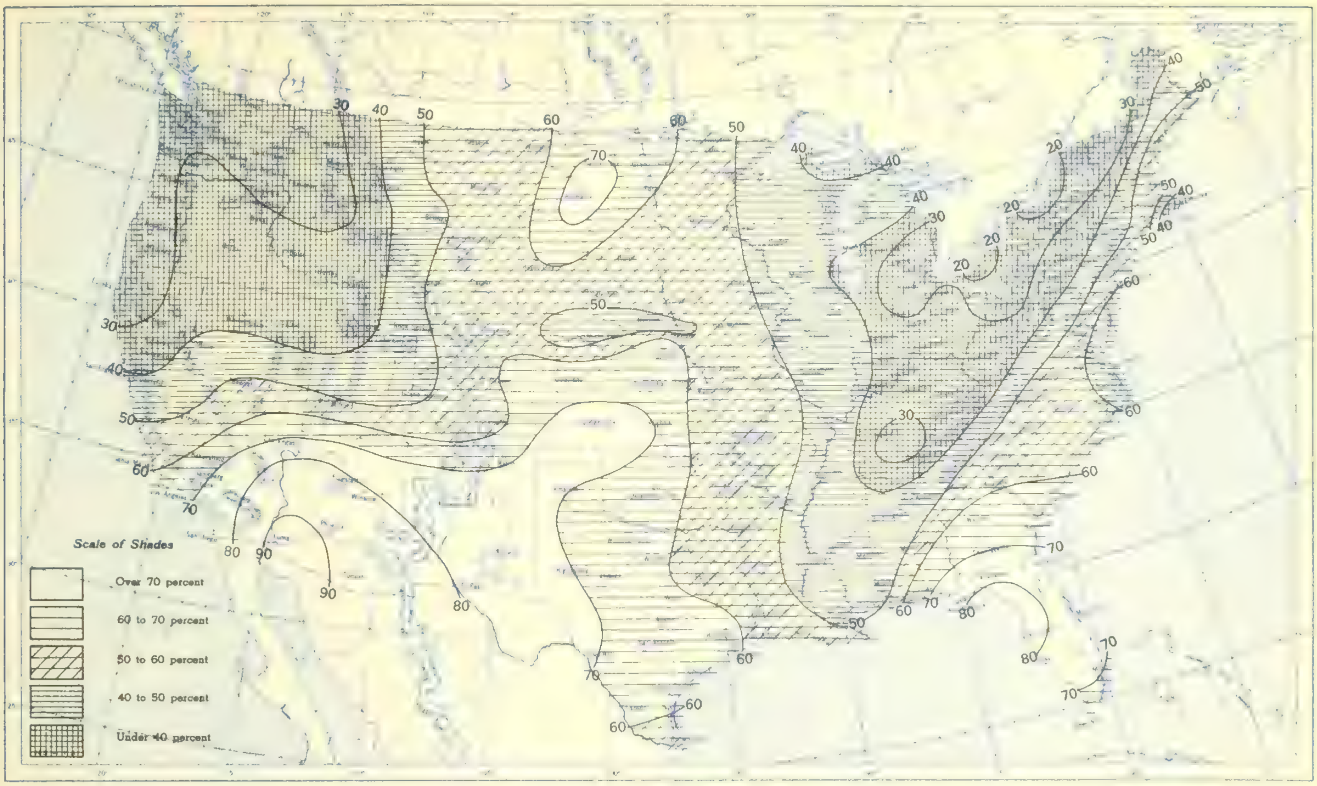


B. Percentage of Normal Sky Cover between Sunrise and Sunset, January 1951.

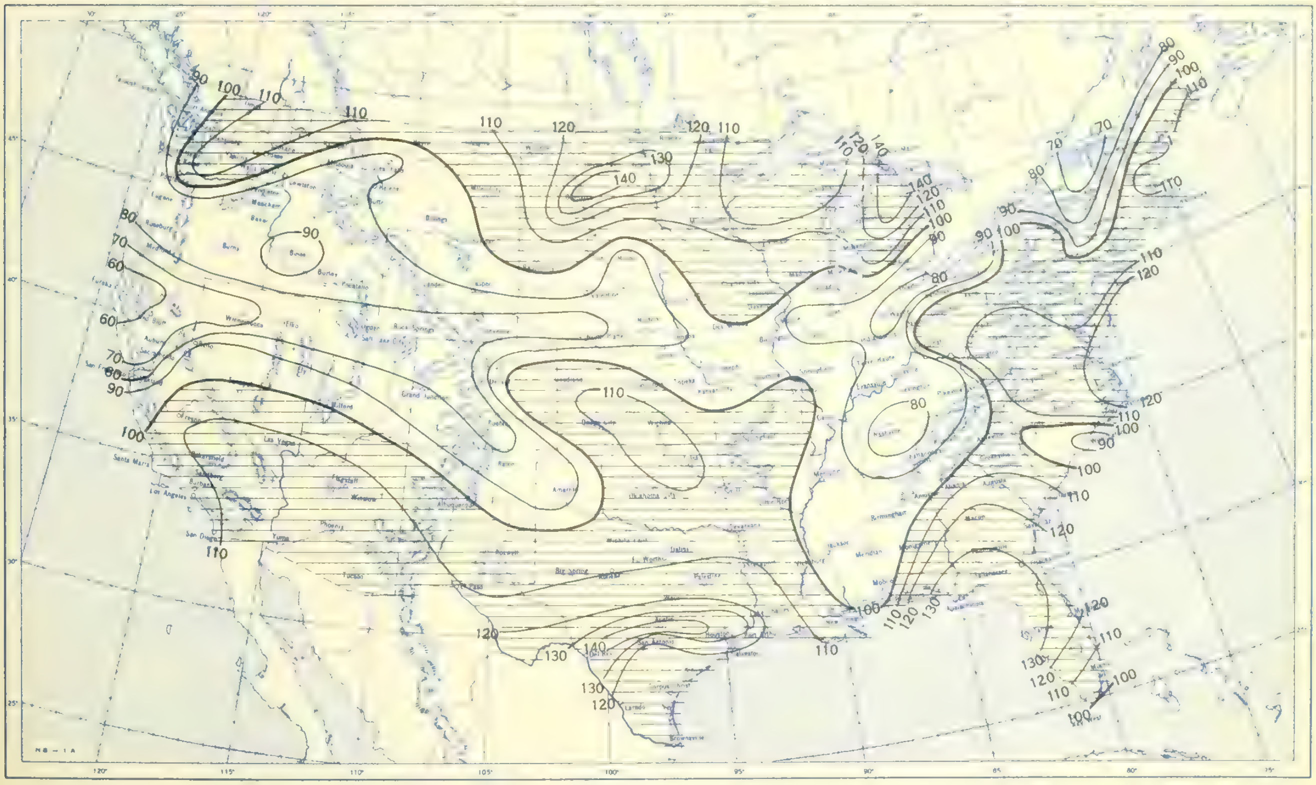


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, January 1951.



B. Percentage of Normal Sunshine, January 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, January 1951. Inset: Percentage of Normal Average Daily Solar Radiation, January 1951.

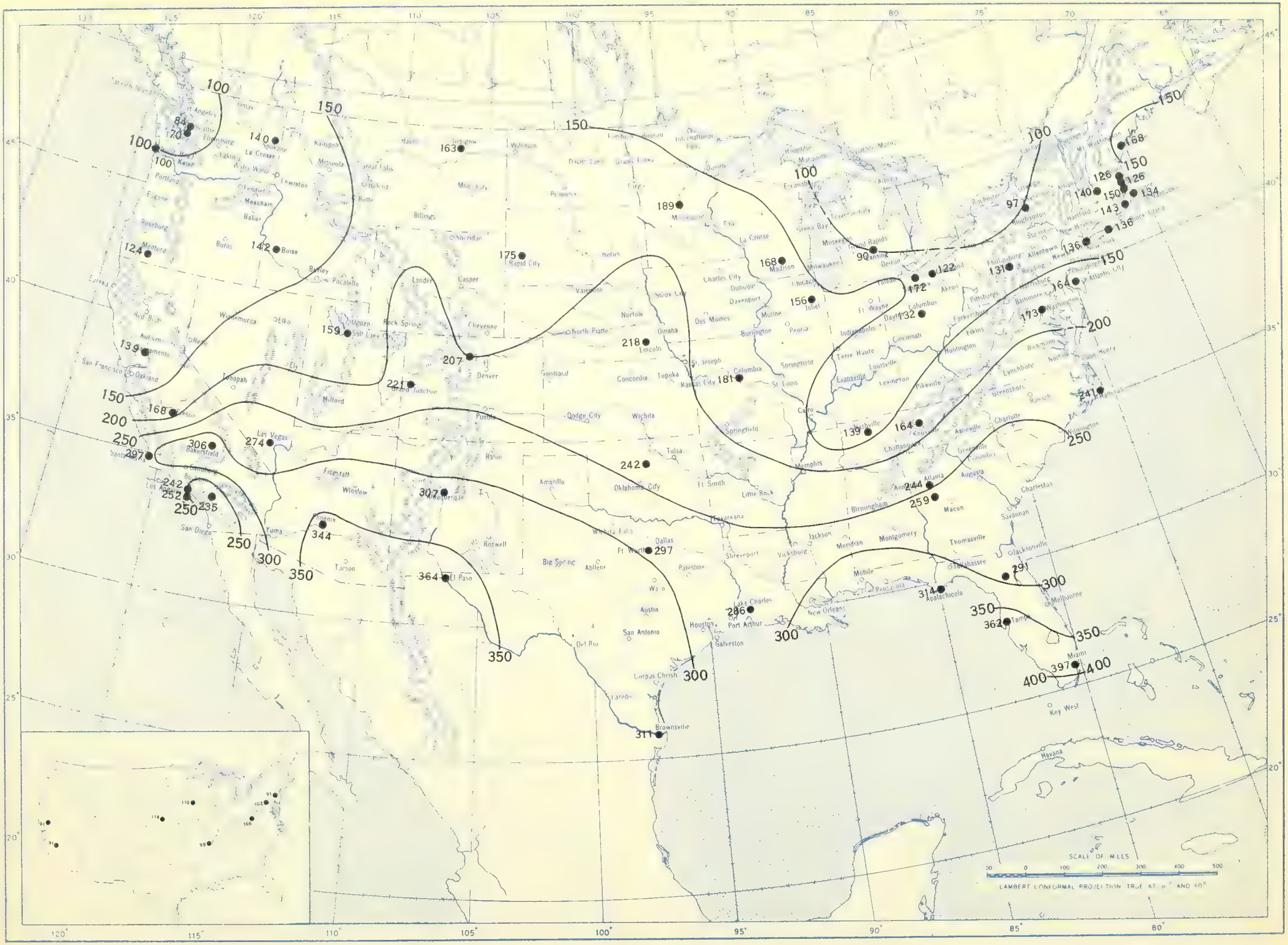
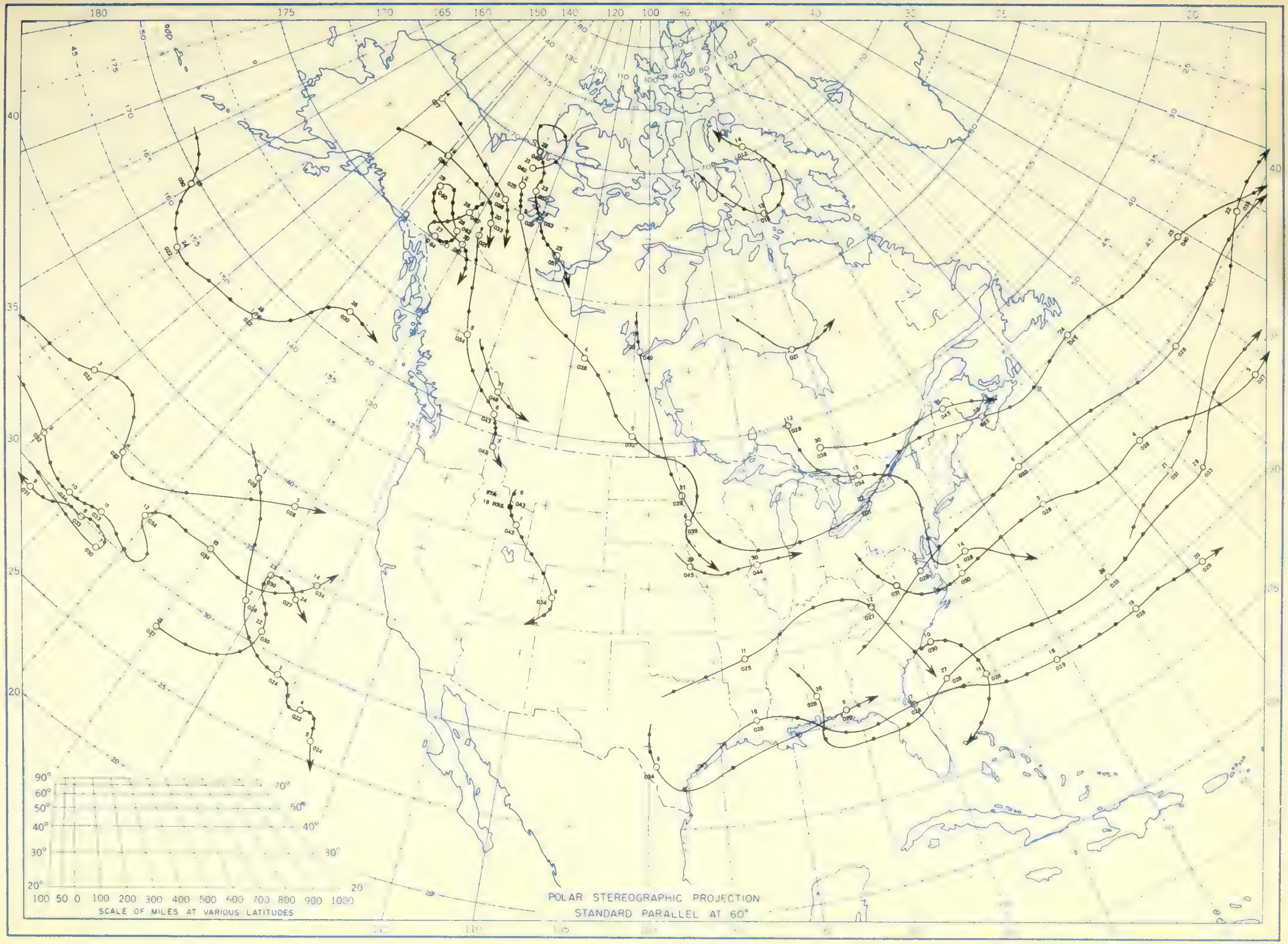


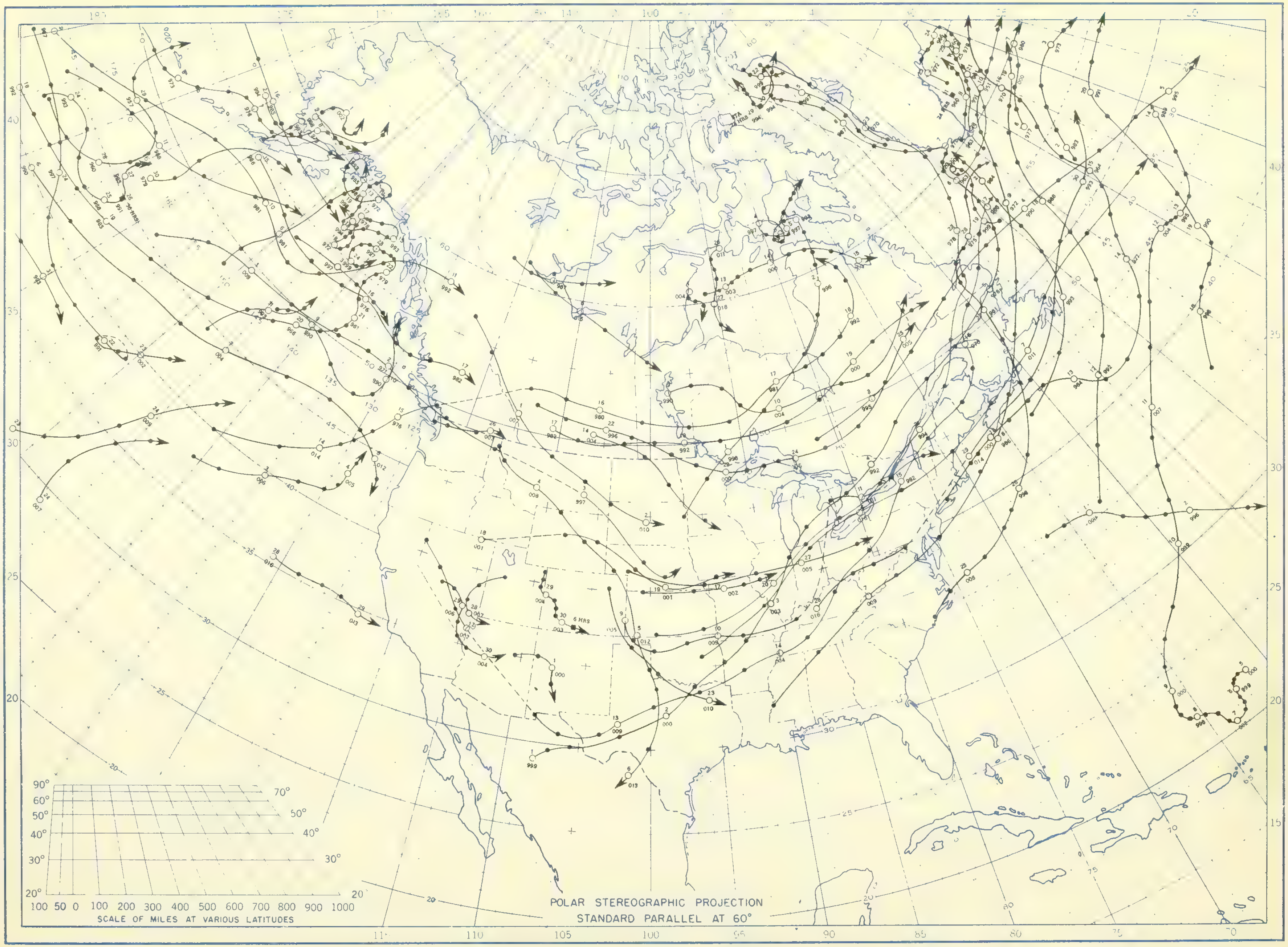
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart IX. Tracks of Centers of Anticyclones at Sea Level, January 1951



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

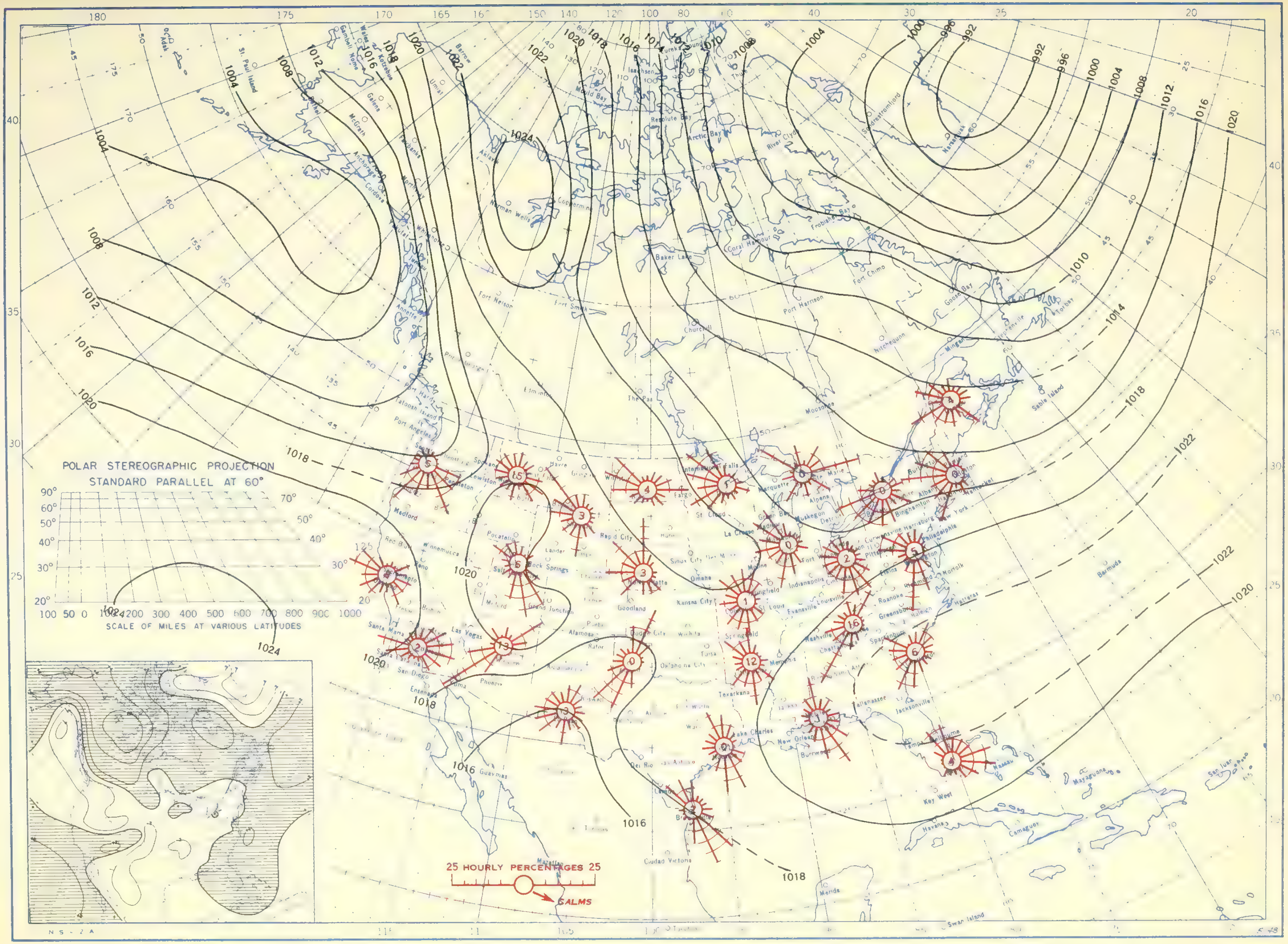
Chart X. Tracks of Centers of Cyclones at Sea Level, January, 1951.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

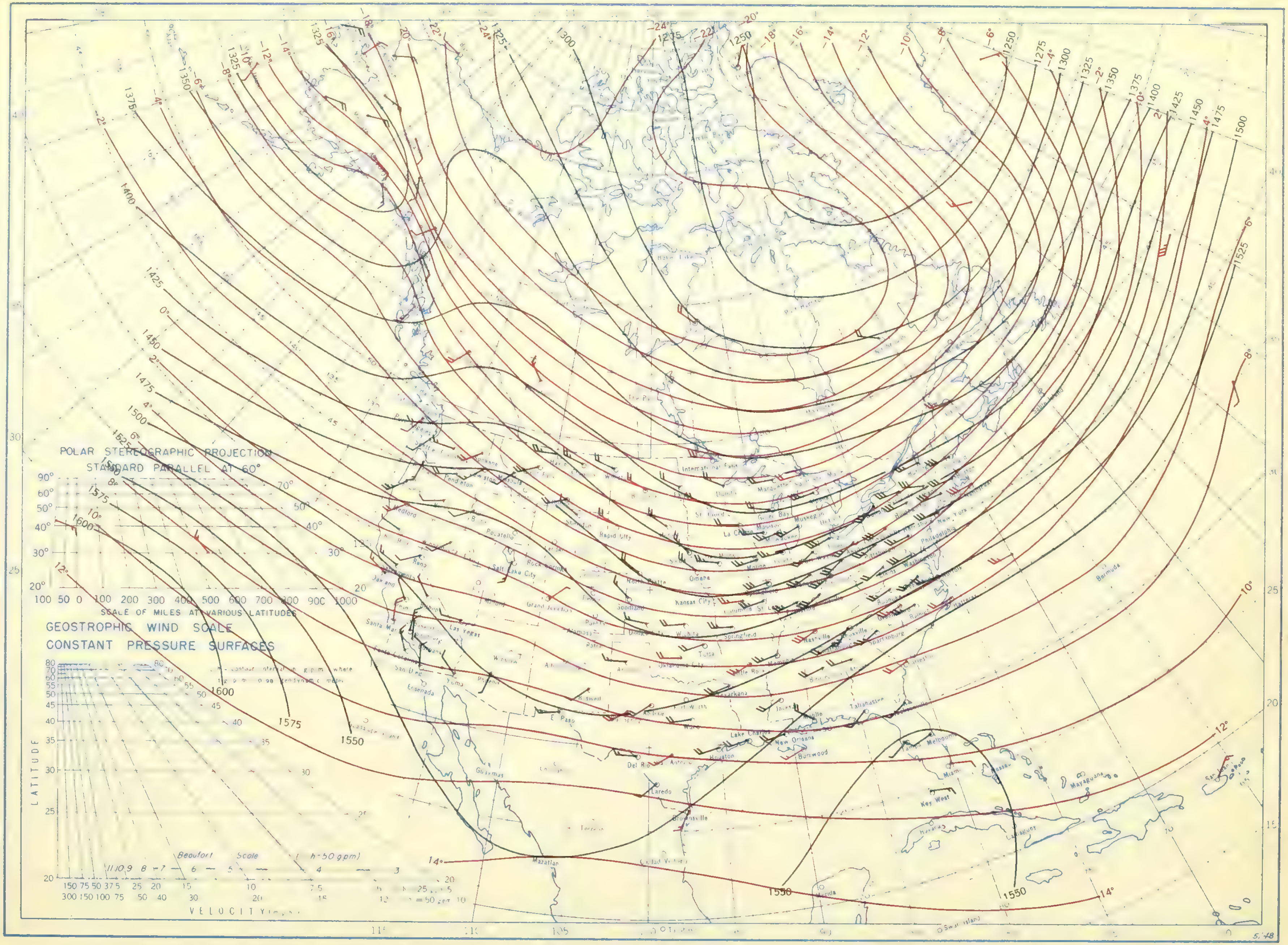
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX 13P explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, January 1951. Inset: Departure of Average Pressure (mb.) from Normal, January 1951.



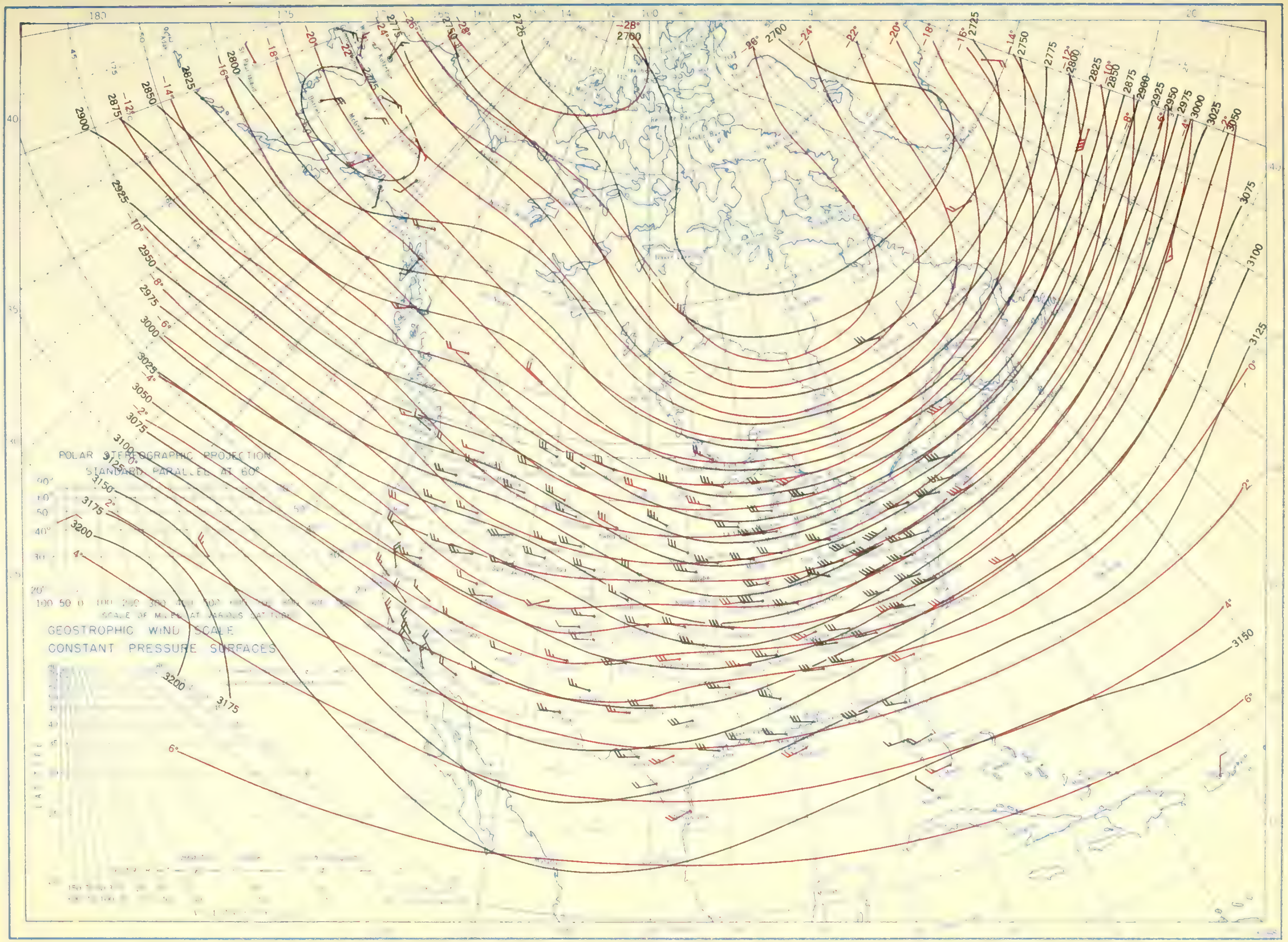
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899-1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), January 1951.



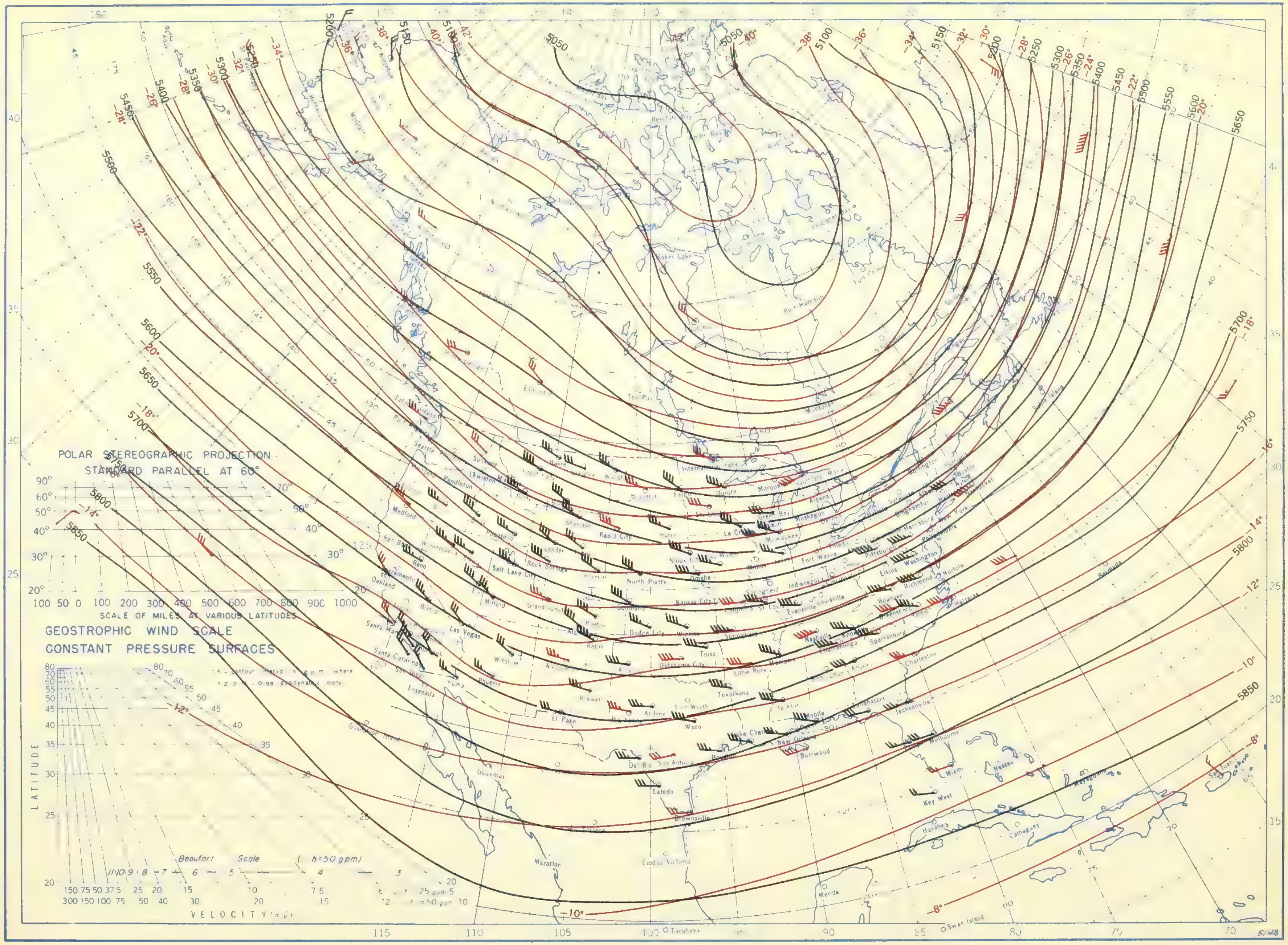
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), January 1951.



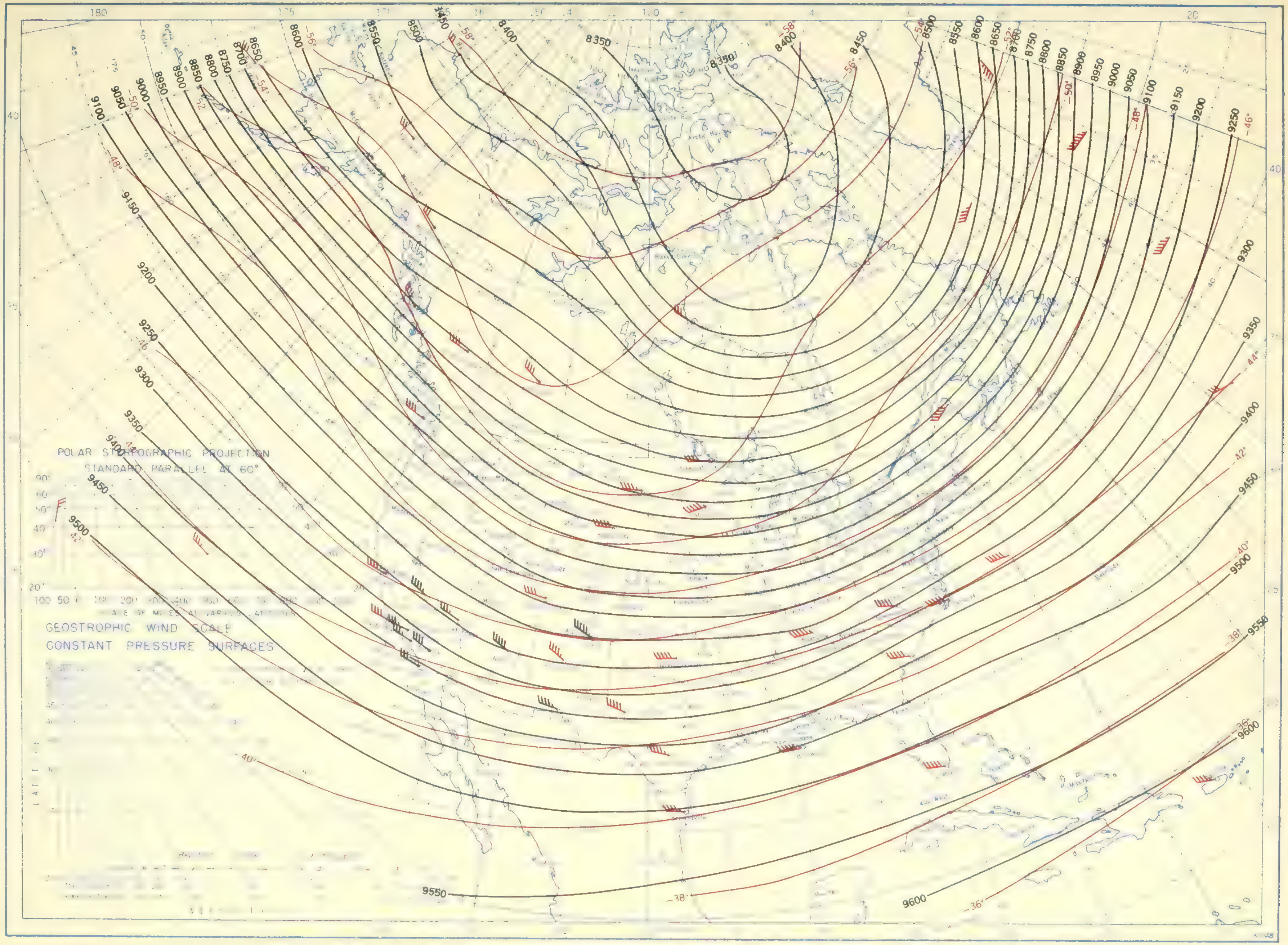
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), January 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), January 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

FEBRUARY 1951
Volume 2 No. 2

WASHINGTON: 1951

CONTENTS

SURFACE DATA Page

General Summary of Weather Conditions---------------------- 26

Condensed Climatological Data - States-------------------- 28

Climatological Data - Stations---------------------------- 29

Heating Degree Days--------------------------------------- 34

Severe Storms--- 35

General Summary of River and Flood Conditions------------- 41

Flood Stage Data-- 45

UPPER AIR DATA

Radiosonde Data--- 47

Pilot Balloon Data-- 50

Rawin Data-- 51

SOLAR RADIATION DATA

Solar Radiation Intensities------------------------------- 52

Blue Hill Data-- 53

Daily Totals and Average Daily Totals by Weeks ----------- 54

CHARTS I-XI

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 2

FEBRUARY 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

This month was warmer than usual. The average temperature for the country was 35.8°, 1.4° above the long-term mean but 1.1° lower than the average for February 1950. Temperatures averaged slightly below normal in the Southeast and at scattered stations in the Southwest and extreme south-central; elsewhere, averages were above normal, with greatest departures exceeding 6° at a few stations in the extreme Northeast and in the northern Great Plains.

The nationwide average precipitation was 2.12 inches, only 0.01 of an inch below the long-term mean. Totals were generally below normal in the Southwest and Southeast, but generally above in extreme northern areas, the Midwest, and central Great Plains. Precipitation occurred at intervals throughout the month without any unusual extremes. The greatest monthly total was 28.95 at Quinault Ranger Station in Washington, while no precipitation occurred at one or more stations in Arizona, California, Nevada, New Mexico, Texas, and Florida.

Snowfall generally was below normal in the Atlantic Coastal States, the Appalachian Region, and in the Pacific States. Elsewhere, the departure pattern was very irregular. Monthly totals were much above normal in a belt extending from eastern Louisiana to Lake Erie; in an area including Kansas, Oklahoma and central Texas; and considerably above normal in the Northern Border States from Wisconsin to Montana.

The Southeastern and Southern States received practically all of their snow during the first 3 days of the month, many stations reporting snow for the first time in several years. A trace of snow fell at Burrwood, La. for the second time since 1908. During the night of February 2-3 snow fell in Florida as far south as Daytona Beach and covered the ground to a depth of 2 inches in the St. Augustine-Crescent City area. On the 3d Cape Hatteras, N.C. received 5.9 inches which was 1.4 inches more than the previous record February total recorded in 1899.

During the passage of a Low off the New England Coast on the night of 3d-4th, light to moderate snow fell along the New England Coast, with heavy amounts in Rhode Island and southeastern Massachusetts totaling up to 15 inches or more at a few stations. Snowfall occurred in the Northeast on the 7th and 8th, with heavy snow in central and eastern New York. Near blizzard conditions prevailed in New York on the 8th.

From the 12th to the 16th intermittent snows fell in portions of the central and lower Great Plains and North Central States. Missouri, Kansas, Oklahoma, and north-central Texas received most of their February snowfall during this period.

On the 28th heavy snow fell in extreme north-central areas, and some stations in this area received their heaviest snowfall of the winter. Totals for this storm ranged up to 15 inches or more in the Dakotas, Minnesota, and northwestern Wisconsin. Near-blizzard conditions prevailed in Minnesota and heavy drifting blocked many roads.

The snowcover at the beginning of the month was unusually extensive, with bare ground only in the Southeast, along the West Coast, and in extreme southern areas. In central areas depths ranged from 1 to 4 inches in some southern States and up to 40 inches in extreme northern Michigan. By the end of the first week most snow in the far West had melted at lower levels, and in central areas as far north as South Dakota, central Iowa, and northern Illinois. In Indiana, Ohio, Kentucky, and north-central Tennessee snow remained on the ground until the 13th. The snowcover in parts of the Midwest and the central and lower Great Plains resulting from the snow that occurred from the 12th to 16th had practically all disappeared by the 19th. At the end of the month the snowcover in the Northeast was limited to central and northern New York and northern New England, and in central areas principally to the Dakotas, Minnesota, Wisconsin, and Upper Michigan.

Total sunshine for the month was above normal in the extreme South, along the Atlantic Coast as far north as New Jersey, and in parts of the Northwest; but was generally below normal elsewhere, especially in the Northeast and north-central interior.

The first 3 days of the month were extremely cold. Only stations in extreme southern Florida and along the West Coast escaped subfreezing temperatures during this period, and subzero minima were recorded at many northeastern stations and throughout the central interior from the Rocky Mountain Region to the Appalachian Region as far south as the northern portion of most Southern States. Minimum temperatures of zero or lower were recorded in all the States, except Rhode Island, Delaware, South Carolina, and Florida. The lowest temperature recorded during the month was -60° at Taylor Park, Colo. on the 1st. This was the lowest temperature ever recorded in that State. On the same date New Mexico recorded a new all-time low of -50°. On the 2d Greensburg, Ind. recorded -35°, which was 2° lower than the previous State record established in 1887. The record for Mississippi, -16°, was equaled. In Texas minima ranged from 18° to 22° in the lower Rio Grande Valley to -19° in the northern Panhandle; and Del Rio recorded its lowest February temperature of record, 11°, on the 2d. Periods of continuous subfreezing were the longest on record at many stations in the southern portion of the State, amounting to 65 hours at Brownsville, 113 at Austin, and 123 at Houston. In Florida temperatures as high as 86° were registered on the 1st, but on the morning of the 3d they had fallen to as low as 10° in the north and to near freezing in the extreme south.

During the closing days of January freezing rain occurred over much of the South and even in some areas of the Northeast, continuing in a few areas through the 1st of February. The load of ice on surface objects was unusually heavy in a belt extending from southwestern Louisiana northeastward to southeastern Ohio. Damage, while, heavy throughout this belt, was most severe in Louisiana and Mississippi where the damaging effects of the ice were augmented by high winds associated with an outbreak of thunderstorms. Forest destruction alone in these two States exceeded $40,000,000. Communication and power lines, and fruit and nut trees also were damaged severely.

Low temperatures caused additional damage to highways, streets, and plumbing. Livestock and wildlife suffered heavily. Gas congealed in pipes cutting off supplies from many homes for heating and cooking. Highway travel was dangerous and in some cases halted. Four lives were lost and at least 300 persons seriously injured in the Louisiana-Mississippi area. The combined total of glaze and freeze damage for the 2 States was $68,522,100.

Somewhat similar conditions prevailed in Tennessee and surrounding areas. In Tennessee freezing rain and/or sleet which began on January 28 continued at intervals through the 31st, when it changed to snow. When the snowfall ceased about noon on February 1, the western and central sections were covered with 6 to 8 inches of ice, sleet, and snow, the water equivalent of which was 5 inches. Damage to trees, and communication and power lines was tremendous. Some buildings collapsed under the great weight of snow and ice, and transportation was paralyzed for 3 days. Air travel to and from Nashville was suspended for 6 days. Many motorists were stranded for 4 or 5 days. Heaviest damage occurred on January 31 in a belt extending southwestward across the western two-thirds of the State almost to the Mississippi River. Thousands of homes were without the means essential for heating and cooking. Business was at a standstill for 3 days in some areas.

Following are a few station notes on the severe freeze, sleet, and icestorm of January 29-February 1, 1951:

Brownsville, Tex.--In January citrus and truck loss nearly complete; even citrus trees were damaged - worst since 1899. Continuous freezing for 65 hours. Heaviest glaze of record, 1 to 1 1/2 inches thick. Communications and power interrupted. First part of February very cold but colder in 1899.

Corpus Christi, Tex.--Communication and power lines down in January. In February pipes were frozen in thousands of homes. Car blocks and radiators were broken. An estimated 30,000 tons of fish killed - heaviest on record. Tender plants were killed. On 2d, 11° was lowest February temperature since station established in 1905.

Austin, Tex.--Last 2 days of January averaged 32° below normal.

Shreveport, La.--Ice, sleet, and snow depths 4 inches last 3 days of January closed schools and stores, and halted air travel.

Lake Charles, La.--A hard freeze with glaze and sleet at the end of January. Some cattle losses. Natural gas lines frozen. Glaze damaged power and communication lines. Thunderstorms occurred on 29th, 30th, and 31st. Lowest temperature on record in February, 13° on 2d. Damage to transmission lines, and heavy cattle losses.

Jackson, Miss.--In January freezing rain began on 29th and continued intermittently until early evening of January 31 when it changed to sleet mixed with snow and then to snow after midnight of January 31. Surface coated with heavy glaze. Thunderstorms occurred in advance of a cold front aloft on January 31 and with passage of cold front aloft with strong, mostly northwest, winds. Heavy damage to trees and utility lines, and some damage to other property.

Vicksburg, Miss.--Glaze during last 2 days of January destructive to trees and power and communication lines. Schools were closed and bus service suspended.

8. Little Rock, Ark.--At the end of January, 3 inches of sleet and snow on ground. Arkansas River frozen over on February 2 and 3.

Nashville, Tenn.--Heavy icestorm January 31. On February 1 glaze was the worst in recorded history. Transportation stalled for 2 days. Many power failures. At least 16,000 homes without electricity. Estimated damage to transportation and communications, $2,000,000. Businesses closed for 3 days.

Mobile, Ala.--In January some nursery damage from frost, and glaze on 25th and 26th. Hard freeze February 1 to 4. Nursery damage tremendous. All crops killed.

West of the Continental Divide, no unusually cold weather occurred after the first few days, although there were periods of below-normal temperatures with freezing almost to the Southern Border on the 7th and 8th, the 13th and 14th, and the 31st.

From the 8th through the 11th abnormally high temperatures prevailed west of the Mississippi River. On the 10th Helena, Mont. recorded its highest early-season temperature in 71 years, Salt Lake City, Utah established a new February maximum of 69°, and Wyoming set a new February maximum record of 77°.

East of the Rocky Mountains a cold air mass invasion on the 7th and 8th brought subzero temperatures of -30° and -40° to northern areas and a freeze to the South. In Florida minima ranged from the middle 20's in the northwest to the middle 30's or low 40's in the extreme south.

A severe cold wave accompanied by snow, sleet, and glaze moved across the central portion of the country on the 15th and 16th, causing temperature falls of 50° to 60° in 24 hours in the lower Great Plains. Thunderstorms with snow occurred in Texas. Below-zero temperatures extended southward to Kansas and Missouri and below-freezing temperatures to south-central Texas.

After the 18th mostly mild temperatures prevailed east of the Rocky Mountains. Moderate to heavy nighttime fogs were frequent, especially in the northeastern quarter of the country. Continuous thawing kept fields and many secondary roads muddy much of the time at middle and northern latitudes.

Heavy precipitation was frequent along the north Pacific Coast during the first decade, and on a day or two near the end of the second decade. Between the Great Lakes and the Gulf Coast the heavy precipitation occurred on the 6th, 14th-16th and 19th-21st. Heavy precipitation fell in the Appalachian Region on the 1st, and in the northeastern coastal areas on the 7th, 17th, and 21st. On the 26th heavy precipitation fell in a narrow belt that extended from northern Wisconsin to the Oklahoma and Texas Panhandles. Thundershowers were unusually frequent and widespread for February east of the Rocky Mountains during the last decade.

An intense extra-tropical storm occurred in the Northeast on the 7th and 8th. Heavy rains and

GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

wind gusts up to more than 80 m.p.h. caused considerable damage (see severe storms). Heavy rains and melting snow caused severe flooding in eastern Kentucky on the 1st. Glaze was the most damaging meteorological element during the month, occurring throughout most of the eastern half of the country.

February generally was a favorable month for agricultural interests in all areas, except in the Southwest where moisture was insufficient for small grains. Severely cold weather during the first week caused heavy feeding of livestock, but mild temperatures were favorable the remainder of the month. By the end of the month vegetation was growing in the South, with peaches blooming in southern Georgia, and pastures and grains greening in central areas as far north as southern Nebraska and central Illinois. In southern Texas corn planting had begun and cotton planting was under way in the irrigated sections of the lower Rio Grande Valley. Cotton planting had also begun in the Yuma and Salt River Valleys of Arizona. Harvesting truck was active in Florida, and planting truck was active in the Gulf and south Atlantic Coastal Plains as far north as the Eastern Shore and Norfolk areas of Virginia. Citrus were satisfactory in California, Arizona, and Florida, with harvest under way in the latter State.

Ice harvest in north-central areas was completed by the end of the month. In the Great Lakes the age and texture of the ice caused by mild weather favored an early breakup, and navigation was expected to open 10 days to 2 weeks earlier than in 1950.

WINTER (DECEMBER-FEBRUARY) 1950-51

The average winter temperature for the country was 33.5°, which is about normal. Temperatures averaged below normal in a belt that extended from the extreme northern Plains through the Midwest into the Southern States and included the entire Mississippi Valley, but averaged above elsewhere.

The country's winter precipitation averaged 6.11 inches, or about 1/2 inch below normal. Totals were generally slightly above normal in the extreme Northwest, extreme Northeast, Lake Region and the Midwest, but below elsewhere. In the Southwest, the southern half of Texas and an area including much of South Dakota and adjoining small portions of Nebraska, Wyoming, and Montana, precipitation was less than half of normal. In the western portions of the lower Great Plains winter grains were deteriorating from lack of moisture.

The coldest period of the winter occurred during the closing days of January and the opening days of February. In many southern areas this was the hardest freeze since 1899. The icestorm that accompanied the freeze was the most damaging ever experienced in the South and on a common basis of property valuations probably caused a greater total damage than the great Wisconsin-Michigan icestorm in February 1922.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 FEBRUARY 1951

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F	°F.		°F			°F		In.	In.		In.		In.
Alabama	50.3	+1.3	Eufaula	85	[illegible]	Valley Head	-2	2	3.10	-2.11	Youngs Store	8.50	Gulf Shores	.64
Arizona	45.0	.0	2 Stations	93	10	Sanders	-22	1	.48	-.78	Crown King	2.50	3 Stations	.00
Arkansas	44.3	+.6	Okay	82	12	Mammoth Springs	-24	2	5.32	+1.73	White Rock	11.59	Fountain Hill	1.23
California	47.1	-.2	Palm Springs	94	9	Soda Springs	-14	23	2.49	-1.37	Gasquet R.S.	15.25	9 Stations	.00
Colorado	29.3	+2.0	Eversoll Ranch	[illegible]	11	Taylor Park	-60	1	.71	-.31	Climax	3.93	2 Stations	T
Connecticut	32.1	+5.4	Stamford	64	27	2 Stations	-11	10	6.00	+1.53	Norwich 3ESE	6.82	Natchaug Forest	3.57
Delaware	37.3	+2.7	3 Stations	73	13	Newark College Farm	6	[illegible]	2.99	-.22	Del.City Reedy Point	4.08	Bridgeville	1.86
Florida	59.6	-1.0	5 Stations	86	†1	Crestview CAA AP	10	3	1.85	-1.16	Fellsmere	3.94	Lake Trafford	.00
Georgia	50.5	+.8	Millen	85	28	Blairsville Exp.Sta.	-1	3	2.01	-2.62	Suches	4.82	Savannah Beach	.95
Idaho	30.1	+2.1	2 Stations	69	10	Island Park Dam	-46	1	2.19	+.47	Roland West Portal	9.76	Howe	.08
Illinois	31.2	+1.3	Harrisburg	73	25	2 Stations	-25	2	4.03	+2.11	Hardin	8.13	Marseilles Lock	1.15
Indiana	30.7	+.1	Shoals Highway 50 Br.	73	26	Greensburg 3SW	-35	2	3.43	+1.03	Covington Bridge	5.33	Elkhart	1.13
Iowa	24.3	+1.7	2 Stations	73	11	Decorah	-38	[illegible]	2.48	+1.39	Lorimor	3.80	Waukon	.99E
Kansas	36.5	+2.5	3 Stations	85	11	Tribune 1W	-23	1	1.62	+.64	Pittsburg	6.40	Goodland WB AP	.08
Kentucky	38.3	+1.0	2 Stations	75	25	Princeton	-32	2	4.53	+1.01	Manchester	9.31	Summer Shade Sub.Sta.	2.37
Louisiana	54.0	+.4	Covington	86	13	Tallulah Delta	-12	2	2.90	-1.58	Franklinton	5.47	Baton Rouge WB AP	1.11
Maine	22.7	+4.6	Portland WB AP	60	13	Lac Frontier	-41	9	4.10	+1.19	Machias	7.94	Jonesboro	3.13
Maryland	36.7	+3.2	Salisbury Police Bks.	77	14	Hancock Fruit Lab.	-7	3	3.04	+.12	Lock Raven Dam	4.71	Ocean City	1.73
Massachusetts	31.4	+6.1	Clinton	67	13	West Cummington	-20	10	4.57	+1.20	Westover Field	7.67	Taunton	2.89
Michigan	22.6	+2.5	Gull Lake Exp. Farm	65	26	Kenton U.S. Forest	-44	9	2.09	+.45	Deer Park State For.	4.61	Standish 2S	.92
Minnesota	14.6	+2.3	Marshall	56	25	Big Falls R.S.	-44	1	1.30	+.55	Sherburn 3NE	2.92	Wheaton	.10
Mississippi	50.4	+.8	Philadelphia 1WSW	86	27	Batesville	-16	2	4.74	-.25	Rosedale	8.39	Gulfport AP	1.75
Missouri	35.8	+2.1	3 Stations	79	†11	Black 6NW	-28	2	4.52	+2.42	Bunker	7.56	Gallatin	.81
Montana	21.7	+.4	2 Stations	72	10	West Yellowstone	-52	1	.83	+.19	Summit	6.58	2 Stations	T
Nebraska	31.3	+4.9	[illegible]	80	†10	Bridgeport	-29	1	1.00	+.31	Lincoln WB AP	3.47	do	.03
Nevada	36.5	+1.4	North Las Vegas Doxarm	82	10	Geyser	-15	1	.63	-.38	Jarbidge	2.35	Indian Springs	.00
New Hampshire	25.7	+6.1	2 Stations	64	†13	First Conn. Lake	-36	10	5.03	+2.36	Dublin	8.40	Bethlehem	2.57
New Jersey	34.8	+4.0	Hammondton	72	13	Layton 3NW	-5	10	4.32	+.89	Long Branch	5.94	Deepwater	2.55
New Mexico	38.4	+.2	4 Stations	85	†8	Gavilan	-50	1	.37	-.32	Caujilon R.S.	1.54	6 Stations	.00
New York	25.9	+3.3	3 Stations	65	†13	2 Stations	-36	10	3.70	+1.02	Bennetts Bridge	6.77	Arcade	.85
North Carolina	44.4	+1.5	Lumberton CAA AP	83	[illegible]	Mt. Mitchell	-10	†7	2.28	-1.67	Coweeta No. 8	7.70	Laurinburg	.90
North Dakota	11.4	+.9	Hettinger	65	†19	Willow City	-37	13	.80	+.33	Garrison	1.91	Baldhill Dam	T
Ohio	31.2	+1.1	2 Stations	72	†19	Peebles 1S	-29	3	3.27	+.87	Wilmington	5.15	Vickery 2NW	1.81
Oklahoma	43.4	+.7	Buffalo	87	12	Smithville	-22	2	3.12	+1.51	Kiamichi Tower	9.48	Kenton 6N	T
Oregon	36.5	+.7	Oakridge R.S.	72	9	Granite 4WSW	-18	1	3.67	+.35	Lees Camp	18.98	00 Ranch	.48
Pennsylvania	31.2	+2.7	Artemas	73	26	Bradford 4W	-21	10	3.55	+.76	Pimple Hill	6.40	Raymond	1.57
Rhode Island	34.8	+5.8	Providence WB City	66	13	Greenville	2	10	3.53	+.04	Austin	5.27	Newport	2.87
South Carolina	47.7	-.2	Yemassee 4W	85	28	Caesars Head	4	2	1.57	-2.47	Cleveland 3NE	4.13	[illegible]	.65
South Dakota	25.1	+5.8	Van Metre	76	10	Hardy R.S.	-38	1	.65	+.10	Canton	3.03	2 Stations	T
Tennessee	42.6	+1.3	Clarksville	78	25	Milan	-23	2	4.99	+.47	Petros	10.67	Memphis WB AP	2.23
Texas	50.3	+.3	2 Stations	95	28	2 Stations	-19	1	1.35	-.20	Boxelder	7.08	15 Stations	.00
Utah	32.4	+2.3	Zion Nat'l. Park	77	10	Woodruff	-37	1	[illegible]	-.51	Alta	6.78	2 Stations	T
Vermont	23.2	+5.1	Dorset 1S	57	†1	Enosburg Falls	-35	10	4.30	+1.82	Searsburg Sta.	6.58	South Newberry	3.47
Virginia	39.2	+1.8	Capron	82	14	Big Meadows	-7	8	2.52	-.50	Rose Hill	6.63	Brookneal	1.26
Washington	34.6	.0	Dallesport CAA	68	9	Bumping Lake	-9	1	5.11	+1.38	Quinault R.S.	28.95	Moxee City 10E	.27
West Virginia	36.0	+2.4	Petersburg WB City	78	26	Birch River 6SSW	-14	1	3.42	+.29	Clay No. 1	7.65	Petersburg WB City	1.60
Wisconsin	17.9	+3.0	Kenosha	56	26	Long Lake Dam	-44	9	1.69	+.49	Wausau CAA AP	3.07	Kewaunee	.79
Wyoming	27.0	+4.8	Dillinger	77	10	Bondurant	-57	1	.56	-.29	Snake River	4.41	4 Stations	.00
Hawaii (January)	69.6	+.3	Puunene CAA	89	11	Haleakala R.S.	36	21	6.43	-.62	Kukui	36.00	Puako	.00

† Other dates also.

CLIMATOLOGICAL DATA

Table 2

FEBRUARY 1951

State and station		Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
	Elevation (ground)	Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	997.3	1022.8	61	37	49.0	+2.5	79	25	7	2	0	9	40	75	4.36	-0.70	1.15	9	1	0.2	T	7.9	S	51	SW	20	5	8	15	6.6	51
Mobile CO	10	------	------	64	45	54.4	-.3	75	28	12	3	0	5	--	--	1.98	-3.35	.94	5	1	T	0	----	---	35	N	7	8	11	9	5.3	56
Mobile	211	1014.9	1023.0	66	43	54.7	----	78	27	11	3	0	6	46	77	2.38	-----	1.14	8	2	T	T	11.3	SSE	--	---	--	6	13	9	5.8	--
Montgomery CO	201	------	------	64	42	53.1	+1.5	80	†27	11	3	0	7	--	--	2.26	-3.19	1.00	7	--	T	T	----	---	--	---	--	--	--	--	---	--
Montgomery	198	1015.6	1022.9	65	40	52.1	+.5	81	27	10	3	0	8	42	73	1.84	-3.61	.62	7	0	T	T	7.5	S	35	S	20	8	9	11	5.8	65
ARIZONA																																
Flagstaff	6993	785.3	1019.2	45	17	31.0	----	65	10	-7	1	0	27	20	66	.99	-----	.47	7	0	19.0	11	7.3	SW	--	---	--	6	6	16	6.5	--
Payson CO	4999	848.0	1017.4	55	29	42.0	----	75	9	13	1	0	21	27	59	1.45	-----	.48	7	0	4.5	3	5.4	S	--	---	--	7	9	12	6.0	--
Phoenix CO	1083	------	------	69	45	56.9	+1.8	87	10	35	1	0	0	--	--	.12	-.65	.11	2	0	.0	0	6.6	---	25	SW	27	--	--	--	---	89
Phoenix	1108	976.6	1016.0	70	42	56.1	----	88	10	32	3	0	1	36	50	.29	-.48	.15	5	0	.0	0	5.0	E	--	---	--	13	8	7	4.5	--
Prescott	5014	846.6	1017.5	54	27	40.3	----	73	10	11	28	0	22	24	57	.81	-----	.27	6	1	7.9	3	7.9	SSW	26	SE	†21	8	8	12	5.5	73
Tucson	2558	926.9	1015.6	67	40	53.7	+1.5	86	10	27	2	0	5	28	42	.13	-.83	.06	3	0	T	T	6.8	SE	35	E	14	12	11	5	4.1	87
Winslow	4880	851.7	1017.2	53	26	39.5	+.8	72	11	8	2	0	26	21	55	.03	-.46	.02	2	0	.1	T	9.6	SE	*37	SW	27	9	9	10	5.3	--
Yuma	203	1011.5	1016.4	75	45	59.7	----	93	10	35	2	1	0	31	39	T	-----	T	0	0	.0	0	7.7	NNE	38	NW	13	14	10	4	3.5	96
ARKANSAS																																
Fort Smith	458	1003.4	1020.3	56	33	44.3	+1.5	74	28	-9	2	0	14	34	72	7.94	+5.38	2.41	12	3	T	2	9.2	NE	33	SW	20	--	--	--	7.3	54
Little Rock	257	1008.1	1021.2	56	36	45.9	+1.0	75	25	-5	2	0	10	37	76	4.06	+.22	1.81	8	0	.1	3	7.9	S	30	SW	20	--	--	--	7.2	52
Texarkana	361	1007.1	1020.8	59	38	48.4	-.6	78	12	-3	2	0	9	39	75	4.25	+.59	1.60	9	2	.0	4	10.4	SSE	--	---	--	4	8	16	7.3	--
CALIFORNIA																																
Bakersfield	489	1000.7	1018.8	65	41	52.8	+.7	77	10	32	28	0	2	38	62	.55	-.46	.28	8	0	.0	0	5.2	ENE	--	---	--	12	8	8	4.7	--
Beaumont CO	2589	926.5	1018.0	59	35	47.1	----	78	9	25	19	0	12	29	55	1.12	-----	.58	7	0	2.9	2	8.5	E	*31	E	14	11	6	11	4.7	--
Bishop	4108	873.4	1015.6	60	24	41.9	----	78	10	11	28	0	23	--	--	.05	-----	.05	1	0	T	0	----	---	--	---	--	10	10	8	5.0	--
Blue Canyon	5280	837.8	1018.0	43	29	35.8	----	60	13	17	26	0	18	25	73	8.19	-----	2.24	15	0	34.0	27	10.5	SE	--	---	--	6	4	18	7.4	--
Burbank	699	991.2	1017.5	66	42	53.9	----	85	9	32	28	0	1	38	62	1.33	-----	.60	5	1	T	T	5.1	SE	*28	N	18	13	11	4	4.2	--
Eureka CO	43	1016.3	1018.6	55	43	48.5	+1.3	66	6	32	27	0	1	--	--	7.56	+1.08	3.82	16	1	.0	0	7.0	---	26	SE	†2	3	4	21	8.0	25
Fresno	331	1007.1	1019.2	62	38	49.9	-.4	72	10	28	1	0	8	42	78	1.60	+.17	.65	9	1	.0	0	6.5	NW	38	W	11	7	11	10	5.9	79
Los Angeles CO	312	------	------	66	47	56.4	+.9	81	6	39	28	0	0	--	--	1.48	-1.59	1.00	5	3	T	T	6.6	---	26	E	15	12	8	8	4.6	78
Los Angeles	99	1014.6	1018.1	62	45	53.4	----	73	14	38	28	0	0	43	72	.94	-----	.48	5	2	T	T	5.4	W	--	---	--	14	6	8	4.4	--
Mt. Shasta CO	3543	892.3	1018.1	46	28	37.0	+.2	61	9	16	1	0	19	29	75	4.31	-1.14	1.07	14	0	19.3	9	8.4	SE	--	---	--	1	9	18	7.9	--
Oakland	3	1018.8	1019.2	59	43	50.6	+.7	66	7	33	1	0	0	42	73	2.46	--.78	1.74	14	1	T	0	4.6	W	--	---	--	6	9	13	6.4	--
Red Bluff	341	1005.8	1018.6	57	40	48.5	-.9	69	13	27	1	0	3	40	76	2.46	-1.46	.96	12	1	T	T	7.5	SSE	38	SE	4	4	7	17	7.3	49
Sacramento	17	1016.6	1018.9	59	41	49.7	-.4	66	7	28	1	0	1	43	80	1.62	-1.40	.75	9	0	T	0	8.8	SE	30	S	26	6	9	13	6.5	48
Sandberg CO	4517	862.5	1017.3	50	34	41.9	----	71	7	21	1	0	13	24	58	.68	-----	.25	7	0	9.2	3	17.5	NNW	---	---	--	9	11	8	4.9	--
San Diego	19	1014.9	1018.1	64	47	55.6	+.5	73	14	41	2	0	0	44	67	.50	-1.53	.26	6	0	.0	0	5.4	W	34	SW	26	14	6	8	4.2	80
San Francisco CO	52	------	------	58	46	52.2	0	68	8	36	28	0	0	--	--	3.00	-.85	1.74	10	1	T	0	6.8	---	25	W	27	8	7	13	6.1	56
San Francisco	1	1018.3	1019.1	58	43	50.1	+.9	65	13	32	27	0	1	44	79	1.80	-1.93	.78	10	0	T	0	8.7	WNW	32	WNW	†25	9	6	13	6.1	--
Santa Catalina	1568	960.0	1017.3	59	46	52.5	----	78	9	37	27	0	0	--	--	1.47	-----	.65	5	0	T	0	----	---	--	---	--	14	5	9	4.7	--
Santa Maria	231	1010.2	1018.9	64	38	51.2	----	79	6	30	22	0	3	41	74	1.88	-----	.84	9	0	.0	0	7.9	E	*27	ESE	23	12	8	8	4.7	--
COLORADO																																
Alamosa	7534	769.1	1021.2	43	5	24.2	----	64	11	-30	1	0	28	--	--	.15	-----	.09	3	0	4.6	3	----	---	--	---	--	7	14	7	5.3	--
Colorado Springs	6175	808.3	1018.2	47	20	33.3	----	72	11	-27	1	0	26	16	52	.22	-----	.12	3	0	2.5	3	10.6	NNW	--	---	--	7	13	8	5.6	--
Denver	5221	834.1	1016.1	47	21	33.9	+3.2	73	11	-25	1	0	26	19	56	.78	+.26	.62	4	0	10.5	7	8.1	S	37	NW	8	6	11	11	6.2	70
Grand Junction	4849	860.1	1020.6	40	21	30.7	-2.2	57	23	-14	1	0	26	20	66	.83	+.25	.45	5	0	10.0	5	7.0	ESE	29	S	23	7	6	15	6.8	63
Pueblo	4799	855.1	1017.0	51	19	35.2	+3.1	77	11	-31	1	0	26	18	54	.27	-.20	.18	2	0	3.8	2	6.9	W	42	SW	27	7	13	8	5.8	59
CONNECTICUT																																
Bridgeport	7	1021.3	1021.9	42	26	34.0	----	62	27	9	9	0	18	26	70	5.07	-----	1.80	9	0	2.6	2	11.4	N	*47	WNW	8	8	4	16	6.1	--
Hartford	15	1015.2	1021.5	41	24	32.4	+5.2	61	27	2	10	0	20	23	72	5.09	+1.26	1.91	9	0	6.1	3	8.9	N	37	NW	24	5	6	17	7.2	45
New Haven	6	1017.3	1021.3	42	25	33.5	+5.6	60	27	6	10	0	20	--	--	4.64	+.92	1.73	12	0	3.6	3	8.6	---	30	NW	8	7	5	16	6.6	56
DELAWARE																																
Wilmington	73	1018.6	1022.3	44	25	34.8	----	68	13	9	9	0	21	24	67	2.96	-----	1.03	7	0	.7	1	9.5	NW	--	---	--	9	7	12	5.9	--
FLORIDA																																
Apalachicola	13	1021.7	------	62	46	54.1	-2.2	74	28	21	3	0	5	--	--	.94	-2.97	.66	4	3	.0	0	----	---	26	NW	7	16	7	5	3.6	82
Daytona Beach	33	1021.3	1022.9	69	45	57.1	-2.1	82	1	31	3	0	2	50	82	2.46	-.14	1.98	4	0	T	T	10.8	NNW	*27	NNW	3	16	9	3	3.1	--
Fort Myers	15	1021.7	1022.0	75	50	62.4	-2.6	84	27	34	3	0	0	52	76	1.96	-.06	1.92	5	0	.0	0	8.3	E	--	---	--	20	4	4	3.1	--
Jacksonville CO	31	------	------	67	45	56.2	-1.8	81	28	25	2	0	4	--	--	1.30	-1.67	.98	4	-	T	0	----	---	--	---	--	--	--	--	---	--
Jacksonville	18	1022.4	1023.5	68	42	55.2	-1.7	82	28	26	2	0	6	43	70	1.71	-1.26	1.25	5	1	T	0	6.4	N	32	SW	1	13	7	8	4.4	72
Key West CO	5	1020.0	1020.7	74	63	68.5	-2.0	81	28	50	3	0	0	--	--	1.27	-.07	.72	6	0	.0	0	9.9	---	30	NW	2	18	6	4	3.5	75
Key West	6	1020.3	1020.7	73	62	67.4	-2.3	80	1	48	3	0	0	59	76	.97	-.37	.61	4	0	.0	0	13.9	E	--	---	--	18	6	4	3.3	--
Lakeland	214	------	------	72	50	60.7	-3.9	84	28	30	3	0	2	--	--	1.92	-.81	1.22	4	1	T	0	----	---	--	---	--	15	10	3	3.4	--
Melbourne	22	1021.3	1022.3	70	51	60.5	-1.6	81	21	35	3	0	0	54	83	3.04	+.98	2.32	6	1	.0	0	10.0	NW	*27	N	11	12	12	4	4.4	--
Miami CO	11	------	------	71	60	65.3	-2.7	80	21	36	3	0	0	--	--	2.12	+.09	1.45	6	0	.0	0	----	---	39	NW	2	10	14	4	4.7	66
Miami	8	1020.0	1021.0	75	56	65.1	----	83	21	39	3	0	0	55	74	2.09	-----	1.58	6	0	.0	0	9.0	NNE	*26	ESE	6	13	12	3	4.0	--
Miami Beach	3	------	------	73	63	67.7	----	81	21	38	3	0	0	--	--	2.21	-----	1.47	7	0	.0	0	----	---	--	---	--	14	7	7	---	--
Orlando	111	1018.3	1022.8	73	47	59.8	-2.3	85	28	31	3	0	2	49	75	2.28	-.03	2.10	4	1	.0	0	8.5	NNE	*28	WSW	21	16	9	3	3.8	--
Pensacola	13	1020.7	1022.8	64	47	55.2	0	76	27	13	3	0	5	47	--	1.58	-2.76	.55	7	2	.0	0	9.0	SSE	26	NW	1	8	11	9	5.6	72
Tallahassee	64	1021.0	1023.3	69	41	54.9	----	80	27	18	3	0	7	41	66	1.79	-----	1.02	5	1	.2	T	6.1	S	--	---	--	12	9	7	4.4	--
Tampa	24	1021.3	1022.6	73	49	60.9	-1.0	80	18	31	3	0	1	49	72	2.06	-.50	1.22	5	1	T	T	7.4	E	28	E	1	19	7	2	2.9	82
West Palm Beach	14	1020.3	1021.2	75	56	65.5	----	84	21	38	3	0	0	55	74	2.59	-.39	1.70	7	0	.0	0	9.0	E	--	---	--	12	10	6	4.8	--
GEORGIA																																
Albany	190	1016.6	1023.8	67	39	53.0	-1.2	81	28	16	3	0	7	39	66	1.05	-3.66	.45	4	1	.0	0	5.3	SSE	52	WSW	21	12	10	6	4.3	--
Atlanta CO	1054	------	------	58	37	47.2	+1.9	75	26	6	2	0	10	--	--	2.92	-1.87	1.37	7	-	----	-	----	---	--	---	--	--	--	--	---	--
Atlanta	977	980.4	1023.2	59	36	47.5	+2.2	76	26	8	2	0	11	35	68	3.78	-1.28	2.34	6	1	T	T	8.6	NNW	*36	W	1	7	8	13	6.4	62
Athens	798	992.2	------	59	34	46.4	----	76	26	11	3	0	12	--	--	2.16	-----	.75	6	2	.3	T	----	---	--	---	--	7	10	11	5.7	--
Augusta	426	1018.6	1023.4	64	34	48.9	-1.0	81	19	16	4	0	12	37	72	2.39	-1.61	1.00	7	0	T	T	6.3	SE	33	WNW	7	12	7	9	5.1	--
Columbus	382	1009.1	1023.4	64	36	50.0	----	80	28	12	3	0	10	40	74	1.22	-----	.37	7	0	T	0	7.8	NE	--	---	--	10	6	12	5.6	--
Macon	354	1009.5	1022.9	65	37	50.7	----	82	28	14	2	0	9	38	67	1.69	-----	.79	6	1	T	0	9.2	NW	47	SW	1	8	11	9	5.5	72
Rome	637	1000.0	1023.7	59	32	45.5	----	77	26	7	2	0	12	35	74	3.47	-----	1.47	7	1	T	0	8.1	N	--	---	--	7	8	13	6.4	--
Savannah	38	1021.0	1023.7	66	39	52.3	-.1	81	27	21	4	0	8	41	73	1.16	-1.98	.73	4	0	T	T	8.4	NE	39	NW	7	9	9	10	5.1	63
Valdosta	200	1014.9	1023.2	68	39	53.8	-1.3	83	18	19	4	0	9	39	--	1.40	-2.65	.54	4	1	.0	0	7.6	NW	--	---	--	13	8	7	4.0	--
IDAHO																																
Boise	2842	920.0	1017.9	45	29	36.9	+3.3	64	10	10	1	0	20	29	73	2.16	+.72	1.00	12	0	3.6	1	11.5	SE	32	NW	25	2	6	20	7.9	45
Lewiston	1413	965.1	1017.6	46	28	37.2	----	56	9	14	1	0	21	29	72	.39	-----	.10	11	0	.6	T	4.7	NE	--	---	--	4	3	21	7.7	--
Pocatello	4444	862.2	1018.3	42	24	32.7	+5.8	59	10	-7	1	0	22	25	74	1.46	+.26	.47	11	0	8.7	4	9.0	SW	31	SW	5	5	2	21	7.6	49
ILLINOIS																																
Cairo CO	314	1008.5	1022.0	49	32	40.5	+2.0	70	25	-5	2	0	11	--	--	6.24	+3.11	3.51	10	1	.2	5	10.5	---	37	NW	21	--	--	--	7.8	40
Chicago	613	995.8	1021.8	35	20	27.3	+2.4	56	26	-15	2	0	22	21	79	2.62	+.52	.84	12	1	6.8	5	11.1	SSW	45	W	26	4	4	20	8.0	36
Joliet	580	999.0	1021.6	34	18	26.0	+1.2	55	26	-20	2	0	24	21	86	2.49	+.88	.96	11	1	4.0	4	11.2	[illegible]	--	---	--	4	6	18	7.8	--
Moline	589	998.6	1022.4	34	17	25.6	+2.1	56	26	-19	9	0	25	19	79	2.56	+.98	.81	10	0	4.9	5	10.3	E	42	W	28	3	4	21	7.9	35
Peoria	659	998.3	1021.7	36	20	27.9	+.7	57	26	-16	2	0	21	22	82	3.44	+1.43	.82	13	1	5.4	3	12.4	S	45	SW	26	4	5	19	7.8	40
Springfield	598	997.3	1021.3	39	22	30.6	+3.0	66	25	-15	2	0	17	25	79	4.43	+2.10	.93	12	1	7.0	3	16.2	S	43	NE	20	--	--	--	7.7	43

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F	°F.	°F.	°F.		°F.				°F.	%	In.	In	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA																																
Evansville	385	1006.4	1022.6	45	26	35.7	+0.8	68	25	-23	2	0	15	30	75	4.64	+1.40	2.26	10	2	3.5	5	10.1	SSW	32	NW	21	--	--	--	8.2	33
Fort Wayne	801	990.2	1022.9	36	20	27.6	+1.0	58	26	-17	2	0	23	22	83	3.85	+1.50	1.21	13	3	5.7	6	10.3	SW	31	SW	26	4	6	18	7.5	40
Indianapolis	796	991.9	1022.5	40	22	30.7	+.4	64	25	-19	2	0	20	25	73	3.76	+1.03	1.64	12	0	4.0	6	12.4	SE	45	NE	20	--	--	--	7.5	38
South Bend	768	992.2	1021.6	36	19	27.3	+1.9	57	26	-17	2	0	22	22	82	1.33	-.32	.30	15	1	6.3	5	13.4	S	*35	SW	26	1	4	23	8.6	--
Terre Haute	585	1001.4	1022.6	41	23	32.1	+.8	66	25	-20	2	0	17	25	79	3.27	+.64	1.32	14	1	3.8	5	11.5	SSE	33	N	21	--	--	--	7.6	39
IOWA																																
Burlington	605	994.6	1021.3	36	19	27.7	+1.3	60	11	-16	2	0	22	22	82	3.65	+.93	.77	13	1	6.2	3	11.2	SE	39	NW	6	3	4	21	8.0	44
Charles City CO	1013	983.1	1022.0	27	10	18.6	+1.5	49	11	-24	9	0	28	--	--	2.98	+1.88	1.14	10	0	11.0	14	7.0	---	22	W	28	6	6	16	7.1	34
Davenport CO	579	998.6	------	35	19	26.8	+1.9	57	26	-12	†1	0	24	--	--	2.65	+1.07	.65	11	1	5.4	5	----	---	--	---	--	--	--	--	---	--
Des Moines	800	988.5	1021.2	34	17	25.5	+1.8	63	11	-15	1	0	25	20	80	2.99	+1.87	1.33	11	1	2.8	2	12.3	SE	43	W	28	--	--	--	8.0	40
Dubuque	641	980.0	1021.0	29	13	20.6	----	47	26	-23	[illegible]	0	26	16	85	2.25	-----	.55	11	1	[illegible]	9	13.0	S	36	WSW	26	3	4	21	8.1	--
Sioux City	1097	977.3	1020.1	38	15	26.5	+6.1	60	11	-16	1	0	26	18	77	2.19	+1.37	1.21	9	1	2.8	1	10.3	SSE	34	NW	6	5	8	15	7.5	44
KANSAS																																
Concordia CO	1375	967.8	1019.3	44	23	33.8	+4.0	77	11	-12	1	0	18	--	--	1.88	+1.00	1.19	6	2	5.2	4	8.4	---	27	N	6	--	--	--	6.4	49
Dodge City	2594	927.9	1017.7	51	24	37.7	+4.5	77	11	-15	1	0	20	24	66	.88	+.11	.63	5	2	1.0	2	14.2	S	44	NW	28	8	7	13	6.4	65
Goodland	3645	887.6	1017.4	49	18	33.2	+.6	76	10	-21	1	0	26	23	73	.08	-.48	.07	3	2	1.9	3	11.2	SW	37	NW	†3	7	8	13	6.3	--
Topeka	926	986.8	1020.0	45	23	34.1	----	75	11	-10	1	0	20	26	76	1.53	-----	.83	8	1	4.3	2	10.4	SE	38	SW	28	--	--	--	7.4	37
Wichita	1372	968.5	1018.3	49	27	37.7	+3.3	77	11	-7	1	0	13	28	73	2.58	+1.33	1.40	8	2	3.8	4	15.6	S	45	N	20	--	--	--	6.5	58
KENTUCKY																																
Lexington	979	986.1	1023.1	45	26	35.4	0	68	25	-15	2	0	16	28	78	3.64	+.02	2.65	12	0	7.9	7	12.1	SSW	--	---	--	6	3	19	7.5	--
Louisville	485	1006.1	1022.7	47	26	36.5	+.5	71	25	-19	2	0	13	29	77	3.36	-.19	.98	14	1	7.1	8	9.6	S	35	NW	21	4	5	19	7.8	35
LOUISIANA																																
Baton Rouge	64	1018.3	1021.9	66	46	55.9	+.8	80	19	13	3	0	5	46	75	1.11	-3.71	.38	6	2	.1	T	8.3	SE	--	---	--	--	--	--	5.9	--
Lake Charles	12	1020.0	1021.0	66	46	55.8	+.7	79	20	13	2	0	6	49	85	2.18	-2.08	1.06	7	0	.1	T	11.2	SE	--	---	--	--	--	--	6.6	--
New Orleans CO	12	1020.3	------	67	49	57.8	+.5	80	26	20	2	0	5	--	--	1.91	-2.34	.76	8	2	T	0	7.0	---	20	SW	20	--	--	--	5.2	52
New Orleans	12	1020.3	1022.2	67	46	56.6	----	80	28	19	†2	0	4	48	79	1.98	-----	.81	7	1	T	0	9.7	S	--	---	--	--	--	--	5.3	--
Shreveport	174	1011.9	1020.8	61	40	50.6	-.4	80	27	2	2	0	7	42	78	2.72	-.57	1.00	9	1	T	4	10.9	SSE	34	W	20	--	--	--	6.7	50
MAINE																																
Caribou	624	996.6	1021.0	26	5	15.2	+4.5	46	[illegible]	-23	10	0	28	8	72	3.24	+1.30	.99	14	0	23.0	26	12.1	NW	*45	SSE	8	8	5	15	6.6	--
Eastport	33	1016.6	1019.6	35	20	27.4	+5.9	54	1	-8	10	0	26	--	--	4.03	+.68	1.01	13	0	30.9	11	12.2	---	57	S	7	6	1	21	7.6	33
Portland	61	1016.3	1020.2	37	17	27.4	+6.6	60	13	-3	10	0	25	20	77	3.71	-.29	1.24	12	0	9.8	8	10.3	NNE	54	S	7	5	8	15	6.9	49
MARYLAND																																
Baltimore CO	14	------	------	46	30	38.0	+2.6	72	13	12	8	0	14	--	--	3.56	+.17	1.49	7	0	----	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1018.6	1023.1	45	28	36.5	----	72	13	10	4	0	17	25	67	3.36	-----	1.47	8	0	.7	1	11.3	NW	56	NW	8	8	10	10	5.7	55
Frederick	294	------	------	45	26	35.5	----	69	27	5	4	0	20	--	--	3.89	-----	1.10	8	-	1.0	1	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Boston	12	1015.6	1020.4	43	26	34.7	+5.9	66	13	8	10	0	18	23	68	3.71	+.34	.97	16	0	9.2	7	13.7	NNW	48	SW	7	5	8	15	6.9	47
Nantucket	43	1019.0	1019.6	42	29	35.2	+4.5	56	27	11	9	0	19	29	80	4.36	+.99	1.62	12	1	21.3	15	14.2	NNW	52	NE	4	3	7	18	8.0	30
Pittsfield	1153	977.3	1022.0	35	18	26.3	+5.0	51	27	-11	10	0	27	--	--	5.04	+2.31	1.42	12	1	10.2	7	8.8	---	--	---	--	6	5	17	7.2	--
MICHIGAN																																
Alpena CO	587	998.3	1022.0	29	15	22.1	+4.1	42	26	-12	9	0	27	--	--	1.94	+.23	.48	15	0	10.7	12	10.5	---	42	SE	6	7	3	18	7.3	42
Detroit	619	994.2	1022.5	34	21	27.7	+2.9	58	26	-2	3	0	21	22	82	3.13	+.95	.63	15	1	4.4	9	9.9	NW	38	NW	27	--	--	--	7.8	36
Escanaba CO	594	998.0	1021.7	26	11	18.9	+3.5	39	26	-17	2	0	25	--	--	1.94	+.45	.73	11	0	12.9	18	10.5	---	31	NW	7	--	--	--	7.0	43
Grand Rapids	638	995.3	1021.8	34	19	26.7	+5.8	53	26	-4	[illegible]	0	25	20	81	2.22	-.02	.60	12	1	4.8	9	10.3	ESE	42	W	26	--	--	--	8.3	39
Lansing	859	988.8	1022.4	33	17	25.2	+3.0	55	26	-10	9	0	25	19	82	1.85	-.05	.39	14	0	5.6	9	15.6	SSE	43	W	27	--	--	--	7.3	35
Marquette CO	677	992.9	1021.3	27	13	19.6	+3.3	52	24	-11	2	0	25	--	--	2.57	+.67	1.18	12	0	18.1	34	8.1	---	26	NW	26	--	--	--	8.1	42
Muskegon	627	997.3	1021.5	33	19	25.9	+2.1	55	26	-2	9	0	25	21	82	2.47	+.67	.77	14	1	11.8	13	9.7	E	--	---	--	3	2	23	8.8	--
Sault Ste.Marie	721	998.0	1021.8	25	9	17.2	+5.8	37	25	-24	9	0	27	11	82	2.67	+1.24	.88	14	0	22.2	33	9.3	E	33	W	7	--	--	--	7.2	36
Ypsilanti	722	992.2	1022.3	34	20	27.0	----	57	26	-7	3	0	23	20	78	3.03	-----	.76	14	1	4.2	8	11.3	SW	33	W	26	3	5	20	8.1	--
MINNESOTA																																
Duluth	1128	964.8	1021.2	21	4	12.9	----	41	24	-29	1	0	27	7	78	1.79	-----	.71	12	0	16.5	25	9.9	NW	45	NE	28	--	--	--	7.2	44
Intern'l Falls	1179	975.6	1021.7	20	0	9.7	+2.1	39	24	-38	1	0	28	5	81	1.76	+.87	.75	14	0	13.5	24	----	---	--	---	--	6	4	18	7.2	--
Minneapolis	830	985.8	1021.1	26	9	17.5	+1.6	44	24	-28	1	0	26	12	78	1.71	+.76	.62	6	0	8.6	13	10.3	SE	42	E	28	--	--	--	7.4	42
Rochester	1014	982.4	1021.6	25	8	16.4	+.3	43	11	-28	1	0	26	12	79	2.03	+1.21	1.16	7	0	6.2	11	10.0	SE	--	---	--	5	5	18	7.6	--
St. Cloud	1034	980.7	1021.1	24	4	14.2	+1.0	40	25	-35	1	0	26	[illegible]	80	2.76	+2.07	1.83	7	1	15.6	13	7.6	WNW	--	---	--	7	6	15	7.0	--
St. Paul	703	993.6	1021.4	26	9	17.4	+1.6	44	24	-23	1	0	26	11	78	1.82	+.90	.70	9	0	9.5	11	10.2	SE	32	ENE	28	5	6	17	7.3	--
MISSISSIPPI																																
Jackson	315	1010.2	1022.2	63	41	51.8	+1.0	82	27	1	2	0	7	42	73	3.39	-1.46	1.44	6	2	1.8	4	9.1	SSE	43	S	20	2	16	10	6.8	49
Meridian	294	1008.8	1022.8	64	39	51.5	+3.0	83	28	8	2	0	7	42	75	3.74	-1.71	1.29	8	2	.6	1	7.1	SSE	--	---	--	5	9	14	6.5	--
Vicksburg	234	1013.9	------	62	43	52.5	+.7	80	27	6	2	0	6	--	--	3.20	-1.62	1.07	8	1	2.5	4	9.4	---	31	SW	20	3	10	15	7.0	50
MISSOURI																																
Columbia	733	990.5	1020.3	44	25	34.6	+3.2	74	11	-9	[illegible]	0	19	26	78	4.15	+2.11	.94	10	3	9.5	8	12.5	SE	35	W	28	--	--	--	7.4	46
Kansas City	741	983.7	1019.8	45	25	34.8	+3.6	73	11	-6	1	0	20	26	75	1.84	+.35	.64	10	3	3.1	3	9.5	SSW	47	SW	28	--	--	--	7.4	39
St. Joseph	809	983.7	1019.8	42	22	32.0	+2.4	71	11	-10	1	0	23	24	77	2.28	+.61	1.28	11	1	1.2	3	11.7	S	46	W	28	6	5	17	7.2	39
St. Louis CO	465	------	------	44	29	36.2	+1.4	69	25	-4	2	0	15	--	--	5.89	+3.33	1.65	13	0	2.1	4	12.5	---	40	NW	20	--	--	--	7.0	41
St. Louis	465	999.7	1020.8	44	27	35.4	+1.4	70	25	-7	2	0	15	28	80	4.98	+2.74	1.59	13	0	2.0	4	10.0	SE	--	---	--	--	--	--	7.6	--
Springfield	1265	970.9	1019.6	49	27	38.0	+4.0	71	11	-11	2	0	16	29	75	5.23	+2.88	1.55	11	1	4.3	4	14.5	S	46	W	28	6	3	19	7.2	53
MONTANA																																
Billings	3568	888.9	1016.4	38	18	27.6	+3.4	69	10	-6	1	0	26	18	69	.64	-----	.32	7	0	13.1	6	12.3	WSW	37	SW	1	3	8	17	7.4	49
Butte	5530	825.9	1019.3	34	7	20.5	+2.2	54	10	-39	1	0	26	14	70	.82	+.40	.31	13	0	11.8	10	7.7	S	--	---	--	4	9	15	7.4	--
Glasgow CO	2090	941.8	1020.4	21	-5	7.9	-4.5	40	23	-33	1	0	28	[illegible]	74	.78	+.38	.38	9	0	8.4	12	----	---	--	---	--	6	4	18	7.2	--
Great Falls	3663	885.9	1016.7	35	13	23.7	-1.6	64	10	-7	12	0	26	11	62	1.34	+.79	.88	7	0	16.0	11	15.9	SW	63	SW	2	4	8	16	7.5	52
Havre CO	2488	925.8	1019.3	28	5	16.6	+3.0	50	10	-19	12	0	28	--	--	.42	-.08	.15	8	0	9.0	5	8.3	---	32	SW	2	4	8	16	6.8	59
Helena	3893	871.0	1018.3	36	15	25.2	+3.6	66	10	-22	1	0	25	16	69	.24	-.13	.15	5	0	2.9	3	6.2	W	43	SW	10	5	7	16	7.4	67
Kalispell	2965	910.3	1016.4	37	19	27.8	----	53	10	-10	1	0	26	21	76	1.52	-----	.62	9	0	13.7	11	7.5	S	--	---	--	4	4	20	7.9	--
Miles City	2629	930.9	1018.3	34	10	22.3	----	62	10	-17	1	0	28	17	--	.28	-----	.11	5	0	4.1	2	8.1	SSE	--	---	--	5	11	12	6.6	--
Missoula	3201	900.8	1018.1	38	22	29.9	+6.1	60	10	-12	1	0	26	22	73	.51	-.29	.20	9	0	4.8	4	4.8	NW	32	W	10	4	4	20	7.8	33
NEBRASKA																																
Grand Island	1841	950.2	1018.4	44	19	31.4	----	72	11	-17	1	0	24	20	69	1.50	-----	1.04	5	2	1.4	1	12.7	SSE	--	---	--	5	8	15	7.0	--
Lincoln CO	1184	975.3	------	42	21	31.5	+5.4	73	11	-13	1	0	22	--	--	2.00	+1.05	1.04	9	2	2.0	2	9.4	---	39	W	28	--	--	--	---	51
Lincoln	1180	975.3	1019.7	42	19	30.2	+5.4	75	11	-14	1	0	26	21	77	3.47	+2.52	1.71	8	1	1.0	2	10.1	SE	--	---	--	--	--	--	7.4	--
Norfolk	1554	962.1	1020.0	40	16	28.2	+4.9	70	10	-15	1	0	26	19	76	1.22	+.35	.91	5	0	.5	1	12.6	SE	--	---	--	--	--	--	6.9	--
North Platte	2783	915.7	1017.4	46	18	31.6	+5.0	72	10	-21	1	0	27	20	70	1.41	+.88	.88	7	4	1.6	2	9.4	SE	43	SE	27	7	7	14	6.6	49
Omaha	978	979.0	1020.2	39	18	28.7	+4.4	68	11	-11	1	0	24	22	79	2.02	+1.13	1.04	7	2	1.3	1	12.0	SSE	45	E	27	--	--	--	7.4	42
Scottsbluff	3950	877.8	1017.5	47	16	31.5	+3.3	67	10	-21	1	0	26	17	61	.12	-.39	.06	3	0	3.5	3	8.6	WNW	--	---	--	9	3	16	6.6	--
Valentine CO	2581	923.1	1018.0	44	14	28.8	+7.4	71	10	-19	1	0	26	--	--	.59	+.04	.47	5	0	2.5	1	8.2	---	36	NW	28	7	7	14	6.7	59

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min. 32° F or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft	Mb	Mb.	°F.	°F	°F	°F.	°F		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEVADA																																
Elko	5075	843.9	1017.8	44	21	32.5	----	67	10	2	27	0	27	26	77	1.27	-----	0.58	11	0	8.0	3	5.4	SW	--	---	--	5	8	15	6.8	--
Ely	6257	807.3	1018.3	44	14	29.3	+2.7	65	10	-10	1	0	27	--	--	.08	-.91	.04	3	0	1.3	1	10.8	---	44	S	22	7	6	15	6.6	53
Las Vegas	2162	939.4	1016.5	60	35	47.5	-.5	77	9	22	2	0	12	20	36	.02	-.39	.02	1	0	.0	0	6.3	SW	--	---	--	10	6	12	5.3	83
Reno	4404	861.2	1016.8	50	23	36.5	+.8	69	9	7	28	0	24	25	63	.43	-.75	.26	5	0	3.6	2	5.4	WNW	45	S	10	4	11	13	6.9	57
Winnemucca	4299	867.6	1018.0	47	23	34.8	+1.3	69	10	8	1	0	23	25	67	.97	+.06	.32	12	0	6.4	2	7.2	---	38	NW	10	4	4	20	7.7	37
NEW HAMPSHIRE																																
Concord	339	1009.5	1020.8	38	16	27.3	+7.0	60	13	-10	10	0	25	19	75	5.54	+2.65	2.10	12	0	5.8	6	6.3	NW	35	NW	24	5	5	18	7.3	48
Mt. Washington	6262	796.5	1020.3	22	6	13.8	+8.8	38	1	-33	8	0	28	--	71	2.64	-2.84	.72	15	0	20.5	16	34.4	W	†114	SSE	7	7	5	16	6.8	39
NEW JERSEY																																
Atlantic City CO	8	1019.6	1021.7	44	30	37.3	+3.7	65	27	13	9	0	14	--	--	4.60	+1.24	2.62	8	0	2.0	1	17.9	---	57	S	1	9	7	12	5.9	66
Newark	11	1020.7	1022.0	44	28	35.5	+5.7	65	13	11	9	0	19	23	63	3.62	+.10	1.50	7	0	.9	3	12.5	NW	†45	N	22	8	7	13	6.3	--
Trenton CO	56	1015.2	1022.4	43	28	35.7	+5.0	64	13	11	9	0	18	--	--	3.36	+.09	1.53	8	0	.5	T	10.2	---	39	S	7	8	8	12	5.9	64
NEW MEXICO																																
Albuquerque	5310	848.6	1016.9	53	27	39.8	-.7	68	11	-5	1	0	17	20	48	.27	-.05	.15	3	0	1.0	2	8.7	SE	42	W	27	10	8	10	5.2	73
Clayton	4969	845.9	1015.9	55	23	38.8	+1.6	81	11	-17	1	0	24	22	57	.51	+.11	.35	4	2	T	1	14.7	W	--	---	--	9	7	12	5.8	--
Raton	6379	802.6	1015.9	53	17	34.6	----	73	11	-22	1	0	28	12	44	.01	-----	.01	1	0	T	T	9.7	N	--	---	--	9	9	10	5.9	--
Roswell	3611	891.6	1016.7	61	25	43.2	+.7	79	8	-8	1	0	23	21	46	.35	-.22	.13	5	2	.7	1	8.8	SSE	47	SW	27	13	6	9	4.5	72
NEW YORK																																
Albany	277	1018.0	1021.7	35	19	27.0	+5.6	49	13	-7	10	0	23	19	74	3.32	+.86	1.07	12	0	5.2	5	10.1	WNW	45	NW	8	6	7	15	6.7	31
Bear Mountain	1300	------	------	37	22	29.0	----	60	13	-4	10	0	25	--	--	4.14	-----	1.60	9	0	2.9	2	----	---	--	---	--	7	10	11	5.9	--
Binghamton CO	858	------	------	37	21	29.0	+5.0	57	13	-5	10	0	24	--	--	3.76	+1.49	1.20	11	0	2.6	2	6.6	---	26	W	8	4	4	20	7.8	36
Binghamton	828	990.5	1022.4	37	19	28.2	----	55	13	-7	10	0	24	21	75	3.76	-----	1.12	9	0	4.9	3	6.3	WSW	--	---	--	4	4	20	7.8	--
Buffalo	693	993.2	1022.2	35	20	27.4	+3.7	60	26	-5	3	0	22	21	79	2.96	+.01	.92	13	0	12.3	10	14.7	SW	40	S	7	4	5	19	7.9	41
New York CO	10	1009.8	------	44	29	36.5	+5.2	62	13	11	9	0	17	--	--	3.21	-.61	1.67	8	0	1.5	1	17.0	---	70	NW	8	10	7	11	5.9	59
New York	19	1019.6	1021.8	44	29	36.6	----	65	13	11	9	0	18	24	65	4.03	-----	1.69	9	0	2.6	3	15.4	NW	59	NW	8	7	10	11	6.3	--
Oswego	292	1009.1	1022.4	33	20	26.2	+3.5	49	27	-6	9	0	22	--	--	3.75	+1.06	1.02	16	0	10.8	15	10.9	---	32	W	7	6	3	19	7.4	33
Rochester	543	1002.4	1022.3	35	18	26.1	+2.2	52	26	-11	10	0	22	20	79	2.70	+.01	.86	16	0	10.2	10	11.1	WSW	43	SW	27	6	5	17	7.2	35
Syracuse	399	999.7	1022.7	33	18	25.4	+2.5	50	13	-12	9	0	24	20	78	5.38	+2.66	1.50	12	0	17.5	13	9.8	E	45	W	8	6	6	16	7.2	39
NORTH CAROLINA																																
Asheville CO	2203	------	------	55	29	41.8	+3.3	78	26	4	3	0	17	--	--	1.80	-1.35	.82	10	0	1.5	1	8.8	---	34	NW	7	10	4	14	5.9	61
Asheville	2093	947.2	1023.5	--	--	----	----	--	--	---	--	-	--	29	72	----	-----	----	--	-	----	--	7.5	NNW	--	---	--	--	--	--	---	--
Charlotte CO	741	994.2	------	57	35	46.0	+2.1	78	26	16	3	0	11	--	--	1.58	-2.60	.69	8	0	.2	T	7.6	---	36	SW	1	7	8	13	5.7	63
Charlotte	753	994.6	1023.1	58	33	45.2	+2.8	78	26	12	8	0	14	31	64	1.36	-2.82	.61	9	0	T	T	8.4	SW	--	---	--	7	8	13	5.7	--
Greensboro	891	990.9	1023.6	55	29	42.0	+2.6	76	†14	10	4	0	17	30	68	1.98	-1.72	.94	9	0	.5	1	9.4	SW	43	SW	1	12	6	10	5.0	60
Hatteras	4	1022.0	1022.5	53	40	46.6	-.8	68	1	22	8	0	5	40	79	3.79	-.24	.92	9	2	5.9	4	14.3	N	43	SW	7	10	6	12	5.5	59
Raleigh CO	400	------	------	57	34	45.4	+2.2	79	26	15	4	0	12	--	--	1.68	-2.24	.68	6	0	1.5	1	6.8	---	30	SW	1	11	8	9	4.8	57
Raleigh	438	1006.8	1023.0	57	31	44.2	----	79	26	10	4	0	15	30	66	1.86	-----	.71	8	0	1.2	1	7.7	SW	--	---	--	11	6	11	5.2	--
Wilmington CO	6	1021.0	1022.4	60	40	50.0	+2.1	78	†14	19	4	0	7	--	--	1.72	-1.54	.52	7	0	3.5	3	10.1	---	46	SW	1	10	9	9	5.5	52
Wilmington	30	1021.4	1022.8	--	--	----	----	--	--	---	--	-	--	40	--	----	-----	----	--	-	----	--	7.3	N	--	---	--	--	--	--	---	--
Winston-Salem	967	987.1	1023.2	55	31	43.3	+3.1	76	14	12	3	0	15	27	56	2.39	-1.28	1.22	9	0	.9	1	10.3	ENE	--	---	--	12	6	10	4.8	--
NORTH DAKOTA																																
Bismarck	1653	956.0	1020.8	21	0	10.7	+2.2	36	38	-28	1	0	28	6	84	.80	+.36	.63	9	0	10.7	14	8.8	E	42	E	28	8	5	15	6.6	56
Devils Lake CO	1471	964.1	1021.3	17	-1	8.0	+2.9	37	24	-25	8	0	28	--	--	.44	-.06	.16	7	0	4.8	15	8.6	---	23	NE	28	--	--	--	7.3	41
Fargo	895	984.1	1020 6	21	6	13.4	+5.3	38	24	-29	1	0	27	10	83	.72	+.03	.59	6	0	12.1	13	14.2	SSE	34	NW	6	--	--	--	7.2	40
Williston CO	1877	948.5	1019.9	22	0	10.8	+2.7	39	15	-23	7	0	28	4	77	.90	+.49	.60	7	0	9.8	15	5.9	---	19	NE	28	--	--	-	7.1	54
OHIO																																
Akron	1210	976.6	1023.0	37	20	28.6	+1.2	60	26	-11	3	0	23	23	82	2.84	+.58	.97	13	0	8.7	11	10.4	S	--	--	--	3	3	22	8.2	--
Cincinnati CO	553	999.3	------	44	23	36.3	+1.9	66	19	-5	3	0	13	--	--	3.44	+.45	1.23	16	0	9.3	11	12.1	---	37	NW	7	--	--	--	---	40
Cincinnati	871	989.8	1022.7	42	25	33.9	----	65	25	-15	2	0	17	26	78	3.23	-----	.84	15	0	7.6	9	13.1	SE	--	---	--	4	5	19	7.7	--
Cleveland	787	993.6	1022.6	38	22	29.9	+3.6	62	19	-8	3	0	20	24	81	3.79	+1.28	1.13	17	0	10.6	13	12.2	SSE	40	W	27	3	3	22	8.4	24
Columbus CO	724	------	------	40	25	32.3	+1.6	64	19	-10	2	0	18	--	--	3.05	+.38	.97	13	0	4.6	7	10.4	---	35	NE	21	5	6	17	7.2	41
Columbus	871	991.9	1023.1	40	22	30.9	+1.7	65	19	-13	2	0	21	24	78	2.82	-.13	.88	15	0	5.6	7	9.8	SSW	*28	NNW	21	4	6	18	7.3	--
Dayton	1002	985.1	1022.8	38	22	30.1	+.2	61	25	-16	2	0	20	24	81	4.27	+1.58	2.73	15	1	5.1	8	10.8	SSW	38	S	6	3	6	19	7.8	47
Sandusky	603	999.0	------	37	23	30.1	+2.7	60	19	-7	2	0	19	--	--	2.67	+.52	.73	12	0	4.4	9	9.7	---	28	W	7	4	6	18	7.6	46
Toledo	621	998.3	1022.5	35	20	27.6	+1.6	59	26	-11	2	0	21	22	81	3.05	+1.00	.66	11	1	6.7	8	12.0	SSW	38	SW	26	3	3	22	8.1	30
Youngstown	1178	978.0	1022.7	37	20	28.6	+.3	62	26	-11	3	0	23	23	82	3.03	+.74	1.00	14	0	8.5	9	11.0	SW	*27	W	7	4	3	21	8.0	--
OKLAHOMA																																
Oklahoma City	1254	971.2	1019.0	53	30	41.5	+1.9	76	11	-1	1	0	14	31	71	2.05	+.94	.72	8	2	8.8	8	17.8	S	55	NNW	20	--	--	--	6.4	--
Tulsa	672	994.2	1019.0	54	31	42.2	+3.1	77	11	0	1	0	15	32	72	3.95	+2 46	1.47	11	3	5.5	5	13.4	S	40	E	20	--	--	--	6.8	58
OREGON																																
Baker CO	3446	894.7	1018.8	40	23	31.6	+2.6	57	10	6	26	0	23	--	--	.82	-.41	.23	11	0	10.6	6	5.9	---	33	SW	10	3	5	20	8.2	46
Baker	3369	------	------	--	--	----	----	--	--	---	--	-	--	24	--	----	-----	----	--	-	----	--	7.2	SE	--	---	--	--	--	--	---	--
Burns CO	4140	872.0	1017.5	41	23	32.0	+3.4	52	10	9	28	0	26	25	75	1.35	+.12	.79	10	0	6.9	9	----	---	--	---	--	2	7	19	7.8	--
Eugene	364	1003.4	1017.3	52	36	44.0	----	68	9	26	27	0	9	39	87	5.23	-----	1.35	17	1	.4	T	7.3	S	--	---	--	3	6	19	7.8	--
Meacham	4050	874.4	1017.8	37	23	29.7	----	53	10	8	28	0	24	24	79	2.99	-----	.58	16	0	14.1	19	7.1	ESE	--	---	--	2	3	23	8.7	--
Medford	1314	969.5	1018.3	51	33	42.2	-.1	66	9	25	23	0	14	36	81	2.72	+.70	2.00	14	0	T	T	4.6	N	*27	SE	2	1	4	23	8.8	--
Pendleton	1489	962.8	1017.5	45	30	37.5	+1.7	62	9	14	1	0	20	29	74	.96	-.60	.36	4	0	1.7	2	7.5	NW	--	---	--	4	4	20	7.9	--
Portland CO	30	------	------	50	39	44.8	+2.7	63	9	25	1	0	3	--	--	4.90	-.46	.98	16	0	T	T	----	---	--	---	--	--	--	--	---	--
Portland	21	1016.3	1017.1	50	36	42.9	+2.9	62	9	26	28	0	8	38	80	5.02	-----	.90	18	1	T	T	6.7	SE	30	SW	2	3	4	21	8.1	38
Roseburg CO	479	998.6	1017.6	53	38	45.2	+1.8	70	9	28	23	0	9	--	--	4.54	+.05	1.96	15	0	T	0	3.5	---	22	SW	1	2	4	22	8.5	27
Salem	195	1009.5	1016.9	51	35	43.1	+.4	66	9	23	27	0	10	38	84	5.43	+.68	1.04	18	0	T	T	7.5	S	--	---	--	3	3	22	8.2	--
Sexton Summit CO	3836	------	------	41	31	35.9	----	56	9	21	25	0	16	--	--	5.17	-----	1.83	16	0	7.5	4	----	---	--	---	--	2	4	22	8.5	--
Troutdale	29	------	------	50	35	42.3	----	62	9	23	1	0	10	36	81	4.88	-----	.99	17	1	.1	T	9.2	E	*30	E	†1	3	4	21	8.1	--
PENNSYLVANIA																																
Allentown	381	1008.1	1022.9	40	24	31.9	+2.1	61	25	7	9	0	21	23	73	3.56	+.26	1.15	6	0	2.1	2	8.7	WNW	--	---	--	9	7	12	5.9	--
Curwensville	2215	------	------	34	17	25.9	----	62	26	-11	3	0	24	21	82	3.57	-----	1.01	14	0	10.6	17	12.9	ESE	*32	WNW	7	3	4	21	8.3	--
Erie CO	655	------	------	37	24	30.2	+3.3	66	26	-2	3	0	20	--	--	3.09	+.51	1.13	12	0	12.1	13	9.3	---	27	SE	16	4	4	20	7.8	31
Harrisburg	335	1008.8	1023.1	41	26	33.4	+3.2	67	26	6	9	0	19	22	65	2.89	-.07	1.20	8	0	1.8	3	8.6	WNW	38	NW	27	9	5	14	6.3	51
Park Place	1932	------	------	37	19	27.9	----	57	26	-4	3	0	25	--	--	3.86	-----	1.93	6	0	3.7	3	----	---	--	---	--	9	3	16	6.6	--
Philadelphia CO	26	------	------	45	30	37.6	+3.7	66	27	12	9	0	15	--	--	3.25	-.07	1.35	6	0	.3	T	8.7	---	42	S	7	9	9	10	5.6	62
Philadelphia	13	1021.3	1022.5	45	28	36.4	+3.9	66	13	12	9	0	16	25	67	3.24	-.08	1.21	6	0	.2	T	10.8	NW	*34	S	7	8	9	11	6.0	--
Pittsburgh CO	749	------	------	43	27	35.2	+3.4	68	26	2	8	0	19	--	--	3.01	+.39	1.03	13	0	2.2	--	----	---	--	---	--	--	--	--	---	30
Pittsburgh	1248	991.2	1022.8	41	25	33.2	+3.4	68	26	0	3	0	19	25	73	2.77	+.15	.84	15	0	2.7	1	10.7	S	32	NW	27	5	5	18	7.6	37
Reading CO	266	1010.2	1022.7	43	28	35.2	+4.7	64	26	10	3	0	17	--	--	3.67	+.25	1.26	7	0	1.5	3	12.8	---	49	S	7	9	6	13	6.0	52
Scranton CO	746	992.6	1022.7	39	24	31.7	+4.5	59	26	5	9	0	20	--	--	3.41	+.37	1.18	7	0	2.5	2	7.2	---	38	NW	8	9	3	16	6.4	40
Williamsport	527	1003.4	1022.9	38	22	30.2	+2.2	62	25	0	9	0	23	20	68	2.56	+.09	1.33	7	0	3.4	2	10.0	WNW	*60	SE	7	6	8	14	6.8	--
RHODE ISLAND																																
Block Island	118	1016.6	1020.4	41	29	35.2	+4.8	55	25	11	9	0	17	--	--	3.31	-.35	.88	11	0	6.6	6	----	---	--	---	--	5	9	14	6.8	--
Providence	55	1014.6	1020.6	43	26	34.2	+6.4	64	13	5	10	0	18	24	69	3.39	-.25	.97	12	0	8.6	8	11.0	NW	45	NW	8	4	9	15	6.9	50

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature								No. of days				Precipitation					Snow, Sleet, Hail		Wind					No. of days (sunrise to sunset)				
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days .01 inch or more	No. of days With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile Speed	Fastest mile Direction	Fastest mile Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
SOUTH CAROLINA																																
Charleston CO	9	1021.3	------	60	42	50.9	-1.5	82	27	26	†2	0	5	--	--	1.18	-1.80	0.73	5	0	0.0	0	---	---	30	SW	1	12	5	11	4.9	70
Charleston	41	1021.7	1023.6	64	37	50.4	+.1	83	27	19	4	0	9	38	71	1.07	-1.91	.51	5	0	.0	0	8.5	NW	--	---	--	11	6	11	5.4	--
Columbia CO	332	1010.2	------	62	38	49.7	+1.5	79	27	20	2	0	9	--	--	1.25	-2.52	.50	6	0	T	T	---	---	32	SW	1	10	9	9	4.8	70
Columbia	217	1014.6	1023.1	63	34	48.2	----	81	27	18	8	0	15	35	69	1.42	-----	.58	7	0	T	0	6.6	SW	--	---	--	12	5	11	4.8	--
Florence	146	1017.6	1022.8	63	35	49.0	----	83	27	18	8	0	12	34	64	.82	-----	.27	5	0	T	T	8.1	NNE	--	---	--	9	12	7	5.1	--
Greenville	1006	984.4	1022.6	56	35	45.1	+1.8	77	26	15	3	0	11	32	65	2.32	-2.86	.81	11	1	.5	T	7.8	NNE	40	W	7	9	6	13	6.2	68
Spartanburg	801	992.6	1023.4	56	34	45.1	+1.1	77	26	13	3	0	13	33	67	2.21	-2.24	1.00	7	0	T	T	8.5	NE	50	WNW	1	9	7	12	5.8	--
SOUTH DAKOTA																																
Huron	1282	970.2	1019.5	35	11	23.1	+8.8	61	10	-16	1	0	27	16	77	.47	-.07	.38	3	0	5.6	3	11.6	SSE	36	NW	6	3	7	18	7.3	53
Rapid City	3215	900.1	1018.0	42	13	27.7	+5.9	74	10	-18	1	0	27	11	61	.10	-.38	.08	2	0	1.1	1	10.0	NNW	39	NW	6	9	6	18	5.9	61
Sioux Falls	1420	966.5	1020.1	36	13	24.2	+5.5	55	22	-17	9	0	26	17	79	1.60	+.86	1.20	7	0	13.5	9	10.9	S	*31	ENE	28	5	8	15	7.1	--
TENNESSEE																																
Bristol	1519	967.2	1023.1	54	28	40.8	-1.4	72	20	4	3	0	18	30	69	2.97	-.83	.91	10	1	.2	T	7.5	F	--	---	--	9	7	12	6.2	--
Chattanooga	670	994.9	1023.0	58	35	46.0	+3.8	76	26	5	2	0	11	34	70	4.16	-.72	1.11	10	1	2.0	2	6.6	S	35	NW	7	6	7	15	6.9	34
Knoxville	949	986.5	1023.1	55	33	44.1	+3.3	75	26	5	2	0	11	34	71	4.80	+.29	1.96	10	2	1.8	1	9.1	SW	39	SW	21	5	8	15	7.0	42
Memphis	263	1006.8	1021.7	54	35	44.5	+1.5	72	18	-11	2	0	9	37	76	2.23	-2.47	.89	9	1	1.6	5	12.8	S	49	SW	20	5	6	17	7.3	45
Nashville	577	1002.4	1022.6	52	31	41.7	+.1	74	18	-13	2	0	12	34	77	2.94	-1.19	.62	10	1	5.2	8	8.1	S	43	W	21	2	8	18	8.1	36
TEXAS																																
Abilene	1752	956.0	1017.5	63	36	49.7	+3.7	85	12	1	1	0	10	30	55	.65	-.36	.34	4	3	3.5	3	16.2	S	45	SW	10	11	3	14	5.6	63
Amarillo	3590	888.6	1016.1	56	26	41.0	+4.9	82	11	-14	1	0	19	26	62	1.17	+.46	1.05	6	1	1.3	3	13.8	SW	43	N	13	--	--	--	5.7	59
Austin	515	997.6	1019.6	66	43	54.4	+1.0	83	12	7	2	0	8	43	72	2.96	+.61	1.30	9	3	1.0	1	10.2	S	34	SE	25	--	--	--	5.5	56
Big Spring	2533	927.9	1017.7	64	35	49.6	+1.7	84	12	0	1	0	9	28	51	.14	-.54	.14	1	1	2.5	3	14.3	S	--	---	--	10	6	12	5.3	--
Brownsville	16	1016.3	1018.3	72	52	62.4	-.2	86	6	22	1	0	3	53	80	1.10	-.39	1.07	3	2	.0	0	14.9	SE	38	NW	14	--	--	--	4.6	59
Corpus Christi	40	1019.0	1019.4	69	49	59.2	+2.5	85	6	18	1	0	4	51	83	1.08	-.40	.94	6	2	T	T	15.3	SSE	38	S	5	12	6	10	4.9	71
Dallas	487	1000.7	1019.5	61	39	50.0	.0	80	12	7	1	0	9	38	69	2.65	+.37	1.20	9	3	2.1	2	11.7	SSE	36	S	25	--	--	--	6.0	48
Del Rio CO	957	983.4	1017.5	70	44	56.7	+.7	85	12	11	2	0	8	37	54	.07	-.47	.02	4	1	T	T	10.2	---	34	NW	19	14	7	7	4.5	71
El Paso	3920	886.9	1015.7	62	33	47.6	-1.0	78	11	10	1	0	10	26	48	.63	+.22	.39	4	1	1.8	1	9.2	N	50	W	17	--	--	--	3.6	79
Fort Worth	688	995.3	1019.9	61	38	49.5	+2.2	33	12	6	1	0	10	37	69	2.43	+.66	1.22	12	5	4.2	4	15.4	S	39	W	20	--	--	--	5.9	--
Galveston CO	7	------	------	61	50	55.2	-1.1	73	6	17	1	0	4	--	--	.34	-2.49	.31	3	--	.0	T	13.3	---	33	SW	6	--	--	--	---	54
Galveston	7	1020.7	1020.9	61	49	55.2	-1.1	75	20	18	1	0	4	51	90	.41	-2.42	.33	3	2	.0	T	13.8	SE	--	---	--	6	15	7	5.5	--
Houston CO	41	1015.9	------	65	48	56.5	+.6	79	28	14	2	0	6	--	--	.98	-2.20	.65	6	1	T	T	11.9	---	33	E	25	--	--	--	6.0	58
Houston	41	1018.6	1021.0	65	45	55.2	-.2	81	28	14	2	0	6	48	82	1.42	-1.46	1.10	6	2	T	T	13.5	SSE	--	---	--	5	9	14	6.6	--
Laredo	500	1002.7	1017.5	75	48	61.6	+1.4	91	28	18	2	2	7	45	60	.26	-.55	.26	1	1	T	T	14.0	SSE	--	---	--	--	--	--	4.7	--
Lubbock	3238	903.5	1016.3	60	28	44.1	-.6	83	8	-7	1	0	14	24	55	.66	+.08	.50	6	1	1.7	2	15.9	WSW	45	N	13	10	4	14	5.7	--
Palestine CO	491	1002.0	1020.3	62	42	51.8	+.6	77	25	9	2	0	8	--	--	3.14	+.09	1.79	7	0	.3	2	9.2	---	26	S	12	5	9	14	6.6	52
Port Arthur CO	5	1019.6	------	64	48	56.2	-.9	76	20	14	2	0	4	--	--	1.32	-2.22	.85	6	2	.1	1	14.0	---	35	N	1	--	--	--	5.9	63
Port Arthur	5	1020.0	1020.8	66	45	55.5	----	78	28	13	2	0	6	49	88	2.85	-----	1.88	6	2	T	T	12.8	SSE	--	---	--	6	7	15	6.5	--
San Angelo	1903	950.6	1017.9	65	38	51.3	+1.9	83	12	1	2	0	10	31	51	.56	-.38	.54	3	2	2.8	3	9.7	SSW	26	WNW	19	10	9	9	5.2	--
San Antonio	782	960.4	1019.1	67	42	54.3	-1.1	81	12	6	2	0	8	43	72	2.43	+.78	1.19	8	1	.4	T	9.8	SE	36	NW	20	--	--	--	5.6	50
Victoria	109	1015.6	1019.7	69	47	57.8	-.2	82	6	15	2	0	8	49	79	.34	-1.81	.12	6	1	T	T	10.9	SSE	46	NNW	13	10	7	11	5.9	--
Waco	504	1000.7	1019.0	64	40	51.7	+.8	80	12	6	2	0	8	41	71	2.07	-.30	.98	7	2	1.0	1	11.0	S	--	---	--	12	5	11	5.8	--
Wichita Falls	1027	981.0	1018.3	60	33	46.2	-1.5	87	12	-1	1	0	13	31	61	1.25	-.07	.64	5	2	4.4	4	13.6	SSE	*35	WNW	20	--	--	--	5.9	--
UTAH																																
Milford	5029	845.9	1018.9	47	19	32.9	.0	70	10	-20	1	0	26	21	65	.42	-.48	.14	4	0	5.0	7	9.6	SSW	--	---	--	6	10	12	6.4	--
Salt Lake City	4222	871.0	1017.7	46	26	36.3	+4.2	68	10	1	1	0	20	26	67	.64	-.60	.21	9	0	3.4	2	5.9	SE	26	SE	10	6	6	16	6.9	52
VERMONT																																
Burlington	398	1006.1	1021.9	31	14	22.5	+3.1	46	7	-21	10	0	26	15	73	3.69	+2.12	1.73	11	0	12.2	6	10.1	S	36	S	7	5	5	18	7.4	35
VIRGINIA																																
Cape Henry CO	16	1021.3	1022.0	50	35	42.5	+1.3	75	1	18	8	0	10	--	--	2.26	-.97	.86	9	0	5.7	3	15.0	---	59	NW	7	13	2	13	5.1	59
Lynchburg	947	987.8	1022.7	50	29	39.3	+1.0	75	26	9	4	0	15	27	67	2.31	-.84	1.32	10	0	1.3	T	9.4	SW	36	S	7	11	7	10	5.4	60
Norfolk CO	11	1019.3	------	54	36	44.7	+2.0	77	14	18	8	0	9	--	--	1.59	-1.63	.52	10	0	2.7	2	11.0	---	34	S	7	--	--	--	---	59
Norfolk	25	1021.7	1022.8	53	34	43.4	+2.7	78	14	17	4	0	10	32	70	1.64	-1.58	.50	8	0	3.5	2	13.2	NW	--	---	--	11	4	13	5.6	--
Richmond CO	162	------	------	53	31	42.4	+2.8	78	14	13	4	0	12	--	--	1.98	-1.19	.79	6	0	.5	T	----	---	--	---	--	--	--	--	---	--
Richmond	162	1018.3	1022.8	53	30	41.3	+2.8	76	14	10	4	0	15	29	67	1.90	-----	.75	6	0	T	T	8.8	NNE	45	SW	1	13	3	12	5.4	59
Roanoke	1192	979.7	1023.0	51	29	39.8	+.6	75	26	6	3	0	15	27	65	2.19	-.59	.80	11	0	1.3	1	11.4	NW	--	---	--	11	7	10	5.4	--
Urbanna	31	1022.0	1022.9	53	30	41.5	----	75	13	10	4	0	15	--	--	2.11	-----	.97	7	0	1.7	1	----	---	--	---	--	10	5	13	5.7	--
Washington CO	72	------	------	47	30	38.9	+3.6	73	13	11	8	0	15	--	--	2.57	-.70	1.30	7	0	2.1	2	8.7	---	36	NW	2	--	--	--	---	58
Wash. Nat'l. AP	14	1019.3	1023.6	47	30	38.6	+3.3	72	13	11	8	0	16	25	64	2.65	-.62	1.29	6	0	3.0	1	11.3	NW	38	NW	22	6	10	12	6.3	53
WASHINGTON																																
Ellensburg	1727	953.6	1017.9	39	18	28.5	-2.5	48	20	9	1	0	28	24	83	.62	-.36	.20	9	0	6.3	10	4.8	WNW	--	---	--	7	4	17	[illegible]	--
Kelso	17	------	------	50	34	42.1	----	61	9	24	28	0	15	--	--	5.11	-----	.86	19	0	1.2	1	----	---	--	---	--	2	7	19	8.0	--
North Head CO	194	1007.5	1015.2	49	39	44.0	+1.0	56	13	31	26	0	4	--	--	9.65	+2.20	2.17	20	0	.8	1	16.3	---	59	S	1	5	4	19	7.3	37
Olympia	190	1008.5	1015.8	49	33	40.6	----	58	14	22	28	0	16	37	88	11.28	-----	4.93	17	1	1.7	1	5.2	S	--	---	--	3	6	19	8.2	--
Port Angeles	11	1013.9	1015.7	45	37	41.4	----	50	9	32	1	0	1	36	81	4.35	-----	1.32	17	0	.2	T	7.7	SW	--	---	--	5	2	21	7.7	--
Seattle CO	14	------	------	49	39	44.0	+1.2	59	10	30	1	0	3	--	--	6.92	+3.03	2.46	13	0	T	0	10.5	---	43	SW	2	3	7	18	7.8	43
Seattle	14	1014.9	1016.0	--	--	----	----	--	--	--	--	-	--	37	79	-----	-----	----	--	-	----	---	7.9	S	--	---	--	--	--	--	---	--
Spokane	2357	946.8	1017.3	39	25	32.2	+.9	54	10	8	1	0	25	26	76	1.61	-.16	.68	12	0	10.6	7	9.3	SSW	32	SW	10	4	7	17	7.3	34
Stampede Pass CO	3960	875.0	1016.8	31	22	26.6	----	46	9	3	1	0	26	--	--	12.01	-----	3.86	18	0	65.2	115	12.5	---	61	W	2	4	6	18	7.6	--
Stevenson CO	319	------	------	45	34	39.6	----	62	9	21	1	0	9	--	--	8.24	-----	1.96	19	0	3.5	2	----	---	--	---	--	4	2	22	8.2	--
Tacoma CO	127	1008.5	1015.6	48	37	42.8	+2.2	59	9	29	27	0	4	-	--	7.29	+2.60	3.12	15	0	1.1	T	8.9	---	32	N	22	4	10	14	7.0	41
Tatoosh CO	101	1011.5	1014.7	46	38	42.4	+1.4	51	8	30	1	0	1	37	84	16.55	+7.10	3.48	19	0	4.0	1	16.2	E	59	E	6	4	4	20	7.9	36
Walla Walla CO	949	981.0	1017.6	47	32	39.3	+2.2	64	8	16	1	0	16	--	--	1.65	-.11	.42	12	0	4.0	2	4.5	---	19	SW	†2	3	9	16	7.4	49
Walla Walla	1200	------	------	--	--	----	----	---	--	--	--	-	--	31	--	-----	-----	----	--	-	----	---	6.1	SE	--	---	--	--	--	--	---	--
Yakima	1058	977.0	1017.1	46	24	34.9	+.9	61	10	14	1	0	26	26	73	.40	-.42	.17	6	0	3.3	6	5.5	W	--	---	--	8	4	16	7.0	--
Seattle-Tacoma AP	379	1001.4	1015.7	47	34	40.6	----	57	9	24	28	0	13	35	81	8.76	-----	3.41	15	0	.5	T	10.8	SW	--	---	--	4	3	21	7.8	--
WEST VIRGINIA																																
Charleston	950	986.5	1023.3	50	28	38.9	----	72	26	-2	3	0	18	29	71	3.57	-----	2.45	12	1	2.2	1	8.4	SW	*29	SW	19	4	6	18	7.7	--
Elkins	1969	949.2	1023.7	46	22	33.5	+2.5	70	26	-5	3	0	20	26	77	2.15	-.93	.61	11	0	2.6	2	5.8	WNW	38	S	7	4	4	20	7.6	39
Huntington	565	------	------	50	28	39.1	+7.3	72	26	-1	2	0	18	--	--	2.95	-1.01	.78	11	0	1.0	2	----	---	--	---	--	--	--	--	---	--
Parkersburg CO	615	------	------	46	26	36.1	+1.9	70	19	-4	3	0	19	--	--	3.03	-.10	1.63	12	0	.8	2	6.1	---	24	NW	7	6	5	17	7.4	43
Parkersburg	837	------	1023.1	--	--	----	----	--	--	--	--	-	-	27	--	----	-----	----	--	-	----	---	8.5	SW	--	---	--	--	--	--	---	--
Petersburg	1013	984.8	------	48	25	36.1	----	78	26	4	3	0	21	--	--	1.60	-----	.48	7	0	T	1	----	---	--	---	--	7	6	15	6.3	--
WISCONSIN																																
Green Bay	689	994.6	1021.9	27	8	17.5	+.1	40	19	-24	†2	0	27	10	72	1.72	+.16	.52	10	1	7.0	11	10.1	SW	66	W	26	4	4	20	7.6	37
La Crosse	669	995.3	1021.3	28	9	18.8	+1.8	43	11	-26	9	0	26	13	79	1.79	+.72	.87	7	1	5.7	14	9.0	SSE	*30	ENE	28	--	--	--	7.6	--
Madison	857	988.5	1021.7	29	10	19.8	+.7	45	26	-25	9	0	26	14	78	1.70	+.20	.37	10	1	8.7	17	12.0	S	43	E	28	--	--	--	8.1	33
Milwaukee	674	994.9	1021.5	31	16	23.5	+2.3	48	26	-19	2	0	26	18	80	1.87	+.04	.64	12	1	7.8	22	13.0	WNW	42	SW	26	--	--	--	8.1	21
WYOMING																																
Casper	5322	834.1	1015.2	41	18	29.6	+1.4	60	10	-16	1	0	26	14	56	.16	-.55	.12	5	0	3.4	1	15.0	SW	--	---	--	6	9	13	6.3	--
Cheyenne	6139	808.0	1016.2	43	18	30.8	+3.5	59	10	-20	1	0	25	15	55	.17	-.47	.16	3	1	3.9	3	14.5	W	57	W	9	7	5	16	6.5	61
Lander	5563	832.4	1017.4	42	14	27.9	+5.4	68	10	-25	1	0	28	15	61	.64	+.01	.34	4	0	11.5	5	6.7	---	57	W	2	8	10	10	5.5	64
Rock Springs	6741	791.1	1018.7	36	18	27.3	+4.9	57	10	-18	1	0	26	15	67	.31	-.38	.19	5	0	4.6	3	16.7	W	*47	WNW	†3	8	7	13	6.1	--
Sheridan	3942	881.8	1016.9	42	16	29.0	+6.4	73	10	-24	1	0	26	18	65	.24	-.46	.11	6	0	6.7	4	7.9	NW	43	W	11	7	10	11	5.9	65

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	‡Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
PACIFIC AREA																																
Canton Island	12	1007.5	1008.0	[illegible]	78	83.3	----	91	1	74	3	6	0	74	79	0.32	-----	0.28	4	0	0.0	0	---	---	--	---	--	10	17	1	4.2	--
Hilo	26	1013.9	1015.2	77	63	70.1	----	83	23	56	9	0	0	64	82	26.12	-----	8.75	22	1	.0	0	6.2	SW	35	SE	21	5	6	17	7.2	36
Honolulu CO	12	------	------	76	67	71.5	+0.7	80	2	61	9	0	0	--	--	2.97	-0.78	1.29	13	0	.0	0	8.5	---	26	NE	†13	8	12	8	5.4	61
Honolulu	7	1015.6	1016.1	78	66	72.1	----	83	4	57	9	0	0	62	74	2.98	-----	1.22	12	0	.0	0	9.9	ENE	--	---	--	8	9	11	5.8	--
Lihue	115	1010.5	1015.6	77	63	69.8	----	81	24	53	22	0	0	62	77	2.16	-----	1.67	13	0	.0	0	10.9	NE	28	E	28	7	9	12	6.2	52
Wake Island	11	1013.2	1013.7	83	74	78.6	----	86	8	69	2	0	0	70	74	1.57	-----	1.04	11	0	.0	0	10.3	E	--	---	--	19	6	3	3.6	--
WEST INDIES																																
San Juan,P.R.CO	82	------	------	79	68	73.7	-1.3	82	5	64	†5	0	0	--	--	.55	-2.21	.15	8	0	.0	0	----	---	--	---	--	--	--	--	---	--
San Juan,P.R.	9	1014.2	1016.2	79	68	73.3	----	81	11	64	23	0	0	64	73	.75	-----	.28	10	0	.0	0	9.8	NE	29	E	1	9	13	6	5.2	64
Santa Isabel,P.R.	----	1014.2	------	83	62	72.3	----	86	2	57	28	0	0	--	--	.52	-----	.48	3	0	.0	0	5.8	---	*20	ESE	2	14	9	5	4.3	--
St. Croix,V.I.	82	1013.9	------	82	68	74.8	----	85	10	62	†22	0	0	--	--	.94	-----	.38	9	0	.0	0	10.9	---	*27	ESE	1	9	15	4	5.1	--
ALASKA												‡																				
Anchorage	134	1006.1	1011.2	23	4	13.2	-5.4	42	22	-19	9	0	28	3	76	.84	.17	.28	8	0	14.3	19	5.4	N	62	S	22	7	3	18	7.0	44
Annette Island	110	1007.1	1011.1	38	30	33.8	-2.3	43	20	20	12	0	18	29	80	7.13	.13	1.43	14	0	3.9	4	11.4	NNW	--	---	--	4	4	20	8.0	--
Barrow	22	1017.6	1018.3	-15	-29	-21.9	-5.3	14	26	-53	20	0	28	-36	47	.10	-.10	.08	3	0	1.0	10	11.1	W	51	SW	26	15	10	3	3.8	--
Bethel	21	1006.1	1007.8	21	3	12.2	3.2	38	13	-26	19	0	28	9	81	3.61	2.79	.81	20	0	35.8	25	12.2	N	*62	SSE	21	3	3	22	8.4	--
Cordova	40	1007.5	1009.1	31	9	19.9	-5.2	42	18	-14	8	0	28	18	83	3.27	-1.12	1.57	11	0	28.2	38	2.5	ESE	--	---	--	6	5	17	7.0	--
Fairbanks	436	996.6	1015.2	4	-20	-7.6	-4.6	40	22	-43	9	0	28	11	76	.91	.40	.28	10	0	9.8	34	3.3	N	47	SW	23	11	1	16	6.0	54
Galena	120	1007.8	1012.9	2	-22	-9.6	-6.1	32	22	-49	6	0	28	-17	63	2.12	1.46	1.20	15	0	20.6	30	9.3	N	*55	SSW	22	9	7	12	5.6	--
Gambell	25	1008.5	1009.5	6	-6	.1	-3.3	34	10	-25	28	0	28	-8	72	4.86	4.01	1.29	12	0	48.6	13	24.3	NNE	75	SE	24	7	8	13	6.5	--
Juneau	15	1011.5	1012.4	28	15	21.6	-5.9	37	†16	-8	†6	0	25	17	77	2.31	-1.89	.71	13	0	17.3	15	5.7	E	36	SE	†22	5	3	20	7.4	41
Kotzebue	10	1012.5	1013.2	0	-17	-8.4	-4.2	26	22	-34	20	0	28	-13	76	1.13	.86	.68	9	0	11.3	23	20.9	NE	*93	---	25	13	4	11	5.0	--
McGrath	334	999.0	1012.5	9	-15	-3.1	-3.9	37	22	-42	9	0	28	-6	77	1.44	.25	.47	12	0	27.4	33	4.8	NW	*75	S	22	8	2	18	6.8	--
Nome	13	1008.5	1009.1	15	-4	5.8	.2	32	22	-29	28	0	28	1	76	1.11	.30	.40	10	0	17.8	30	16.2	ENE	72	SW	25	12	1	15	5.6	--
Northway	1713	949.5	1016.6	-2	-25	-14.0	-5.1	22	†22	-56	7	0	28	20	68	.15	-.23	.06	6	0	2.2	12	2.8	S	--	---	--	9	5	14	6.1	--
St. Paul Island	22	1000.3	1001.4	33	26	29.6	6.3	39	25	14	†4	0	22	26	84	1.60	.09	----	23	0	6.2	1	----	---	--	---	--	0	2	26	9.5	--
Umiat	337	1007.9	1022.4	-18	-39	-28.4	-10.4	26	22	-63	20	0	28	-34	70	.36	.14	.09	11	0	4.0	16	8.5	W	--	---	--	13	6	9	4.6	--
Yakutat	28	1009.1	1010.3	32	16	23.9	-5.6	43	19	-14	7	0	27	19	77	6.21	-2.46	1.57	14	0	40.5	33	5.7	E	*28	SE	16	7	3	18	6.9	--
Wales	9	1011.5	1012.2	3	-14	-7.1	-6.6	32	11	-28	19	0	28	--	--	.48	-.42	.22	7	0	5.6	21	----	---	--	---	--	12	4	12	5.5	--

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
† Other dates also.
‡ Number of days Max., 70°F. or above for Alaskan Stations.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

FEBRUARY 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	447	2355	2144
Mobile (CO)	301	1443	1336
Mobile	299	1493	
Montgomery (CO)	351	1823	1737
Montgomery	370	1966	1731
ARIZONA			
Flagstaff	946	4518	5025
Payson (CO)	639	2314	
Phoenix (CO)	230	840	1233
Phoenix	249	946	
Prescott	688	2699	
Tucson	321	1083	
Winslow	709	2995	
Yuma	168	555	928
ARKANSAS			
Ft. Smith	565	2763	2645
Little Rock	525	2560	2465
Texarkana	463	2169	
CALIFORNIA			
Bakersfield	333	1408	
Beaumont (CO)	496	1585	
Bishop	642	2692	
Blue Canyon	813	3456	
Burbank	307	998	
Eureka	456	2691	3116
Fresno	416	1704	1906
Los Angeles (CO)	235	753	891
Los Angeles	322	1057	
Mt. Shasta (CO)	777	3777	
Oakland	396	1711	
Red Bluff	456	1962	2066
Sacramento (CO)	402	1710	2030
Sacramento	422	1805	
Sandberg (CO)	641	2443	
San Diego	258	829	1027
San Francisco (CO)	353	1896	2096
San Francisco	412	1820	
San Jose	372	1458	
Santa Catalina	350	1222	
Santa Maria	379	1622	
COLORADO			
Alamosa	1138	5755	
Colorado Springs	879	4313	
Denver	866	4045	4194
Grand Junction	954	3980	
Pueblo	829	3932	4164
CONNECTICUT			
Bridgeport	864	3781	
Hartford	906	4086	4470
New Haven	878	3889	4250
DELAWARE			
Wilmington	838	3733	
DIST. OF COLUMBIA			
Washington (CO)	725	3132	3482
Washington	736	3152	
FLORIDA			
Apalachicola	302	1249	1053
Daytona Beach	222	929	
Fort Myers	100	470	
Jacksonville (CO)	264	1135	1009
Jacksonville	282	1214	
Key West (CO)	33	85	52
Key West	43	104	
Melbourne	133	614	
Miami (CO)	73	286	154
Miami Beach	39	167	
Int. Airport, Hialeah	55	648	
Orlando	157	701	
Pensacola (CO)	280	1291	1076
Tallahassee	282	1392	
Tampa	131	612	498
West Palm Beach	58	290	
GEORGIA			
Albany	343	1688	1393
Atlanta (CO)	489	2486	2399
Atlanta	484	2405	
Athens	515	2500	
Augusta	448	2201	1911
Columbus	416	2108	
Macon	396	1962	1937
Rome	548	2753	
Savannah	362	1746	1369
Valdosta	316	1536	
IDAHO			
Boise	783	3858	4206
Lewiston	774	3638	
Pocatello	899	4595	4892
ILLINOIS			
Cairo (CO)	685	3220	3149
Chicago (CO)	1007	4556	4564
Chicago	1052	4959	
Chicago University	1035	4726	
Joliet	1083	5221	
Moline	1096	5146	
Peoria	1033	4849	4572
Springfield (CO)	916	4296	4202
Springfield	957	4564	
INDIANA			
Evansville	815	3799	3449
Ft. Wayne	1043	4849	4606
Indianapolis (CO)	915	4211	4135
Indianapolis	955	4487	
South Bend	1051	4937	
Terre Haute	918	4409	
IOWA			
Burlington	1039	4985	
Charles City	1297	6067	5760
Davenport	1061	4941	4769
Des Moines	1101	5100	5018
Dubuque (CO)	1200	5405	5167
Keokuk (CO)	1010	4616	4351
Sioux City	1070	5307	5269
KANSAS			
Concordia (CO)	867	4034	4188
Dodge City	756	3729	3891
Goodland	890	4256	
Topeka (CO)	822	3798	3961
Topeka	859	3998	
Wichita	757	3513	3638
KENTUCKY			
Lexington	826	3829	3653
Louisville (CO)	767	3516	3430
Louisville	793	3647	
Pikeville (CO)	646	3060	
LOUISIANA			
Baton Rouge	275	1401	1288
Lake Charles	237	1307	
New Orleans (CO)	234	1047	1042
New Orleans	257	1190	
Int. Airport, Moisant	255	1204	
Shreveport	411	1882	1802
MAINE			
Caribou	1388	6485	
Eastport	1045	4977	5756
Greenville	1272	6208	6684
Portland	1045	4927	5197
MARYLAND			
Baltimore (CO)	749	3154	3400
Baltimore	791	3491	
Frederick	818	3678	
MASSACHUSETTS			
Boston	841	3645	4246
Milton	969	4339	
Nantucket	827	3600	3903
Pittsfield	1077	5161	
MICHIGAN			
Alpena (CO)	1194	5609	5736
Detroit	1038	4668	4758
Escanaba (CO)	1283	6222	6103
Grand Rapids (CO)	1027	4729	4869
Grand Rapids	1067	5060	
Iron Mountain	1310	6521	
Lansing	1110	5153	
Marquette (CO)	1267	6191	6044
Muskegon	1088	5071	
Sault Ste. Marie	1333	6597	6488
Traverse City	1181	5541	
Ypsilanti	1055	4805	
MINNESOTA			
Duluth (CO)	1407	7308	6916
Duluth	1454	7604	
International Falls	1546	8113	
Minneapolis	1327	6300	5995
Rochester	1353	6510	
St. Cloud	1419	7022	6592
St. Paul	1328	6290	
MISSISSIPPI			
Jackson	381	1913	1811
Meridian	394	2036	1931
Vicksburg	372	1844	1741
MISSOURI			
Columbia	844	4059	3944
Kansas City	839	3827	3869
St. Joseph	921	4229	
St. Louis (CO)	800	3767	3590
St. Louis	824	3888	
Springfield	750	3650	3550
MONTANA			
Billings	1041	5183	5314
Butte	1243	6929	
Glasgow (CO)	1598	7037	
Great Falls	1149	5490	
Havre (CO)	1353	6331	6228
Helena	1109	5957	5696
Kalispell	1035	5639	5813
Missoula	978	5539	5533
NEBRASKA			
Grand Island	934	4698	
Lincoln (CO)	933	4517	4590
Lincoln	969	4747	
Norfolk	1026	5099	
North Platte	929	4612	4782
Omaha	1008	4815	4694
Valentine (CO)	1006	5124	5311
NEVADA			
Elko	903	4612	
Ely	992	4748	
Las Vegas	486	1808	2211
*Reno	795	3743	4027
Winnemucca	840	4023	4618
NEW HAMPSHIRE			
Concord	1048	4878	5362
Mt. Washington	1430	8844	
NEW JERSEY			
Atlantic City	766	3175	3535
Newark	819	3567	4067
Trenton	814	3574	3888
NEW MEXICO			
Albuquerque	699	2812	3507
Clayton	725	3496	
Roswell	605	2605	2868
Raton	848	4164	
NEW YORK			
Albany	1057	4805	4883
Bear Mountain (CO)	1002	4538	
Binghamton (CO)	1004	4609	4943
Binghamton	1025	4886	
Buffalo	1045	4626	4824
New York (CO)	790	3371	3842
La Guardia Field	789	3323	
Oswego	1079	4681	
Rochester	1082	4732	4847
Schenectady (CO)	1047	4689	
Syracuse	1101	4821	4957
NORTH CAROLINA			
Asheville (CO)	654	3246	3234
Asheville	695	3478	
Charlotte (CO)	528	2547	2570
Charlotte	531	2668	
Greensboro	638	3102	
Hatteras (CO)	509	1959	1935
Raleigh (CO)	545	2558	2584
Raleigh	573	2742	
Wilmington (CO)	415	1989	1931
Winston-Salem	603	2970	
NORTH DAKOTA			
Bismarck	1517	7185	6664
Devils Lake (CO)	1593	7829	7483
Fargo	1447	7317	
Grand Forks	1520	7587	7373
Williston (CO)	1514	7146	6906
OHIO			
Akron	1012	4828	
Cincinnati (CO)	797	3644	3807
Cincinnati	865	4105	
Cleveland (CO)	949	4273	4407
Cleveland	976	4458	
Columbus (CO)	907	4148	4135
Columbus	948	4396	
Dayton	970	4523	4058
Sandusky (CO)	974	4344	4423
Toledo	1039	4762	4575
Youngstown	1013	4777	
OKLAHOMA			
Oklahoma City (CO)	613	2740	2952
Oklahoma City	650	2826	
Tulsa	633	2902	
OREGON			
Baker (CO)	928	4616	5134
Baker	958	4890	
Burns (CO)	921	4665	
Eugene	581	2904	
Meacham	982	5033	
Medford	631	3033	3410
Pendleton	763	3698	
Portland (CO)	559	2808	3107
Portland	612	3047	
Roseburg (CO)	547	2548	3048
Salem	606	3019	
Sexton Summit (CO)	809	4047	
Troutdale	631	3144	
PENNSYLVANIA			
Allentown	921	4183	
Curwensville	1088	5337	
Erie (CO)	966	4265	4498
Harrisburg	877	3965	4061
Park Place	1033	4878	
Philadelphia (CO)	762	3280	3544
Philadelphia	793	3445	
Pittsburgh (CO)	828	3839	3979
Pittsburgh	885	4179	4231
Reading (CO)	828	3657	3906
Scranton (CO)	928	4240	4569
Williamsport	970	4465	4511
RHODE ISLAND			
Block Island	830	3460	3942
Providence (CO)	807	3601	4302
Providence	857	3848	
SOUTH CAROLINA			
Charleston (CO)	390	1741	1537
Charleston	409	1915	
Columbia (CO)	426	2114	2038
Columbia	469	2291	
Florence	450	2220	
Greenville	553	2649	2436
Spartanburg	551	2674	
SOUTH DAKOTA			
Huron	1157	6050	5987
Pierre	1078	5384	5506
Rapid City	1039	5159	5170
Sioux Falls	1136	5850	
TENNESSEE			
Bristol	671	3402	
Chattanooga	527	2733	2601
Knoxville	581	2948	2903
Memphis	566	2706	2513
Nashville	647	3119	2870
TEXAS			
Abilene	425	2053	2143
Amarillo	667	3009	3248
Austin	324	1360	1443
TEXAS (Cont.)			
Big Spring	425	2051	
Brownsville	161	555	551
Corpus Christi	224	802	854
Dallas	423	1918	1980
Del Rio (CO)	275	1238	1328
El Paso	480	1893	2122
Ft. Worth	435	1935	1971
Galveston (CO)	278	962	1016
Galveston	283	994	
Houston (CO)	271	1046	
Houston	299	1168	1127
Laredo	195	754	
Lubbock	581	2734	
Palestine (CO)	380	1648	1741
Port Arthur (CO)	267	1115	1162
Port Arthur	289	1281	
San Angelo	385	1844	
San Antonio	319	1363	1246
Victoria	250	966	
Wichita Falls	525	2392	
Waco	382	1714	
UTAH			
Milford	894	4205	
Salt Lake City (CO)	751	3628	4171
Salt Lake City	795	3859	4472
VERMONT			
Burlington	1186	5265	5801
VIRGINIA			
Cape Henry	625	2517	2619
Lynchburg	712	3325	3151
Norfolk (CO)	565	2399	2560
Norfolk	599	2608	
Richmond (CO)	628	2891	3026
Richmond	660	3021	
Roanoke	703	3342	
Urbanna	652	2864	
WASHINGTON			
Ellensburg	1019	4939	
Kelso	631	3370	
North Head (CO)	582	3461	3512
Olympia	676	3631	
Port Angeles	657	3953	
Seattle (CO)	582	2962	3325
Seattle	378	3612	
Spokane	911	4644	4669
Stampede Pass (CO)	1070	8132	
Stevenson (CO)	705	3453	
Tacoma (CO)	615	3238	3488
Tatoosh Island (CO)	629	3907	3873
Walla Walla (CO)	715	3416	3743
Yakima	838	4335	4334
WEST VIRGINIA			
Elkins	875	4378	4261
Huntington	720	3235	
Parkersburg (CO)	803	3742	3752
Petersburg	804	3864	
Charleston	724	3398	
WISCONSIN			
Green Bay	1326	6433	5768
La Crosse (CO)	1241	5752	5616
La Crosse	1292	6167	
Madison (CO)	1221	5685	5475
Madison	1260	5901	
Milwaukee (CO)	1137	5259	5060
Milwaukee	1154	5505	
WYOMING			
Casper	987	5098	
Cheyenne	950	4945	5195
Lander	1034	5286	6003
Rock Springs (CO)	958	4978	
Rock Springs	1051	5442	
Sheridan	1003	5264	
ALASKA			
Anchorage	1444	8442	
Annette Island	870	5076	
Barrow	2442	13034	
Bethel	1476	8812	
Cardova	1256	7292	
Fairbanks	2036	11166	
Galena	2090	10870	
Gambell	1818	9141	
Juneau	1218	6863	
Kotzebue	2059	10370	
McGrath	1909	10543	
Nome	1656	9213	
Northway	2211	12134	
St. Paul	985	6740	
Yakutat	1140	6640	
Umiat	2620	13220	
Wales	2019	9759	
*LATE REPORT			
Tonopah, Nev.	774	4201	

Data from airport unless otherwise specified. CO indicates data from city office.

SEVERE STORMS

Table 4

FEBRUARY 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Louisiana, entire State	Jan. 29-Feb. 2				4	100	$17,901,000	$4,476,000	Ice (glaze) and severe freeze	This ice storm began in northwestern portion on January 29 and spread southeastward to coast and Baton Rouge area on 30th, continuing except in north, where turned to sleet and snow on 31st. During afternoon of 31st a wave developed and moved north of New Orleans with thunderstorms to west and north of front. Where trees and power and communication lines were heavily iced the wind attending the thunderstorms caused severe breakage. As front moved eastward during night of 31st, rain turned to sleet and on morning of February 1 this turned to snow. Snow flurries occurred in New Orleans and as far south as Burrwood on February 1. A breakdown of estimated losses include: Communications and power lines $1,250,000 Forests 10,000,000 Highways 5,000,000 Buildings, roofs, plumbing, auto radiators, etc. 1,651,000 Total $17,901,000 Fruit, nut trees, and nursery stock $2,500,000 Cattle and other livestock 976,000 Grains, truck, and pastures 1,000,000 Total $4,476,000 Grand Total $22,377,000 Pecan trees suffered heavily from the ice, and orange groves nearly all killed back when temperature fell to 18°. Considerable livestock loss due to drowning in ice-coated ponds and streams. Tests at Tallulah show that only 10 percent of hibernating boll weevils were killed by below-zero temperatures in ice-and snow-covered areas of State. The lowest temperature in State of -12° at Tallulah was only 4° higher than the previous all-time low for the State of -16° in 1899.
Mississippi, entire State	Jan. 29-Feb. 2				16	200	41,411,425	4,720,000	do	See remarks same storm under Louisiana. The lowest temperature in State of -16° at Batesville equaled all-time record low of -16° recorded in 1899. Greatest damage to trees in southwest where large, century-old oaks were shattered; that area had the most valuable timber, but more trees were damaged in northeast. Damage to pecan trees severe in some areas; one farmer lost 800 20-year old trees in Yazoo County. An estimated two million game birds were lost. Cover crops and small grains protected in much of State by heavy snow- and ice-cover. Damages estimated as follows: Communication and power lines $3,500,000 Forests 30,190,425 Highways and streets 6,000,000 Buildings, roofs, plumbing, autos, etc. 1,721,000 Total $41,411,425 Fruit, nut trees, and nursery stock $2,650,000 Livestock 1,660,000 Truck, grains, etc. 410,000 Total $4,720,000 Grand Total $46,131,425
Tyler to Port Arthur, thence southwestward to Laredo, Tex.	Jan. 29-Feb. 4								Ice	Extensive damage to trees, shrubs, and communication lines. Disruption of electric power resulted in loss of heating facilities for thermostat controlled furnaces. Heaviest damage from Corpus Christi to Richmond, and in Tyler area.
West Virginia, most west and central counties	Jan. 31-Feb. 1								Rain, ice (glaze), sleet, and snow	Most of smaller streams overflowed their banks, locally closing roads, eroding farm lands, and damaging some farm houses and buildings. Ice on trees caused some damage from broken limbs. Ice and slush on streets, roads, and highways slowed traffic and caused some accidents.
Ohio, most of State	Jan. 31-Feb. 1								Snow and ice (glaze)	Heavy snow beginning January 31. Average depth close to 10 inches over most of State. Traveling made difficult; some rural schools closed. Snow accompanied by glaze over southeastern quarter of State, causing heavy damage to trees and power lines.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
North Carolina, northern Piedmont counties	1	11:45 a.m. to 1:30 p.m.			0	0	$2,000		Winds (tornadic)	Struck Smith-Reynolds Airport at Winston Salem at 11:55 a.m., moving from southwest. Had damaged small downtown section a few minutes before. Gusts to 75 m.p.h. recorded at airport. Roofs, store windows, and cars damaged. Total damage in Winston-Salem, $2,000. Driver of Trailways Bus reported violent twisting winds east of Greensboro at 1:15 p.m. Winds actually lifted bus from highway for a second or two; bus not damaged.
New England, entire section	1	Forenoon			4	100			Ice (glaze)	Beginning near midnight, glaze coated all surfaces, causing many highway accidents and pedestrian injuries. In some sections wires accumulated ice 1 1/2 inches in diameter, stalling trackless trolleys. Innumerable short circuits. In Boston hospitals alone over 100 persons treated for injuries, resulting from falls. Visibility down to near zero at times aggravated traffic hazards. A sudden surge of warm air in late afternoon and night quickly alleviated the condition.
Appomattox County (about 1/4 mile east of McLean Surrender House), Va.	1	2 p.m.	50	‡100	0	0	1,500	$500	Tornado	A small black cloud moved in from southwest and finally swirled down to touch the earth. It uprooted trees and wrenched a barn, corn crib, and a number of outbuildings from their foundations. Storm lasted from 1 to 2 minutes.
Richmond, Va.	1	2:45 - 3 p.m.					1,000		Line squall	Many large trees felled. Two department store display windowpanes blown out. Electric power poles downed, interrupting service on 30 lines for almost 3 hours.
Kentucky, southeastern portion	1						1,000,000		Rain	Heavy rains melted a thick layer of snow which poured into Cumberland and Kentucky Rivers and their tributaries, resulting in severe floods. Barbourville and Pineville hardest hit. Over 3,000 persons forced from their homes.
Alabama	1-2						131,000		Sleet and wind	Damage to telephone company lines and poles in northwestern Alabama.
Winston and Franklin Counties, Ala.	1-2						25,000		do	Damage to lines of Alabama Power Company.
Kentucky	1-3				2				Snow and cold wave	Travel and communication facilities hampered severely, and hundreds of schools closed. Temperatures, except in scattered areas, ranged far below freezing, and in most areas went to below zero. Snowdrifts more than a foot deep, and actual snowfall in many places measured 8 inches or more. Many roads slick and blocked.
Marble Hill, Mo.	2	Morning					300		Cold wave	Local fire department truck engine froze and burst. Water pipes and water meters froze. Lowest temperature 32° below zero.
South Florida (From Tampa-Melbourne line to Ft. Myers-West Palm Beach line)	2-3	Began early morning of 2d.					500,000		Cold rain and wind	Rain continued for 16 to 24 hours, with amounts at most stations between 1.25 and 1.75 inches. By late afternoon of 2d, temperatures ranged from middle 30's along Tampa-Melbourne line to 42° at Ft. Myers and 50° at West Palm Beach. Minimum temperatures on 3d ranged from 31° at Tampa to 38° at West Palm Beach. Losses were due to death of open range cattle, estimated to have numbered about 5,000 head. These cattle were in rather poor condition on account of pasture grasses having been killed by cold wave of November 25-26, 1950.
North and central Florida (from Marianna, Compass Lake and Carrabelle eastward to Atlantic Coast and southward to Daytona Beach, Deland, Lakeland and Bradenton)	2-3								Snow	Light snow (sleet at a few stations) fell over this area during various portions of the 18-hour period ending at 6 a.m. the 3d. Total snowfall was only a trace at most stations, but measurable amounts were as follows:- St. Augustine, 2 inches; Crescent City, 2 inches; Palatka, 1 inch; St. Augustine Beach, 1 inch; Monticello, 0.5 inch; and Tallahassee 0.2 inch.
Opelousas, La.	6	3:50 p.m.	Narrow	Short	0	0	10,000		Tornado	Moved northeastward.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Hammond, La.	6	5 p.m.	Narrow	5	0	0	$10,000		Tornado	Moved northeastward.
Benham, Ky.	6	8-8:20 p.m.					5,000		Wind (possible tornado)	A few small buildings and signboards damaged. By description of area hit and location of damage, the storm may have been a small tornado. Since the storm occurred at night and was accompanied by rain any funnel-shaped cloud which may have occurred was not visible.
Maryland, entire State	7	Noon							Snow, ice (freezing rain), and wind	Main highways slippery and secondary roads blocked with jammed vehicles and fallen trees from Eastern Shore to westernmost county. State police and highway maintenance crews were busy throughout night trying to keep roads, covered with ice and packed snow, open. Telephone officials estimated that 10,000 telephones were out of service as a result of storm. Winds from 30 to 40 m.p.h. uprooted trees and ripped off branches heavily laden with glaze, severing telephone and power lines.
Wake County, N.C.	7								Winds	Two homes severely damaged in Varina. Roofs and part of second floor blown away. A few roofs also damaged in south Raleigh.
Pennsylvania, most of State	7				4	8			Snow, ice (glaze), and wind	Greyhound bus skidded on Pennsylvania Turnpike near Willow Hill Interchange and was broken in two, with 4 deaths resulting. Two persons were injured when their car skidded off highway east of Harrisburg. High winds and glaze brought down power lines in several areas around Harrisburg. Glazed highways resulted in several minor traffic accidents.
Maine	7-8	8 p.m.-10 a.m.			1		500,000		Southerly gales and rain	Gales battered entire State, with heavy rains at night, generally 1- to 2-inch amounts. Wind gusts attained speeds of 50 to 87 m.p.h.; south or southwest gale-driven tide and surf pounded coast from Penobscot Bay eastward. Inland damage wrought havo through Penobscot, Aroostook, and Washington Counties even to northernmost parts. At Brewer $7,000 loss when 3,000 broilers were killed by unroofing o brooder. At Eastport, an estimated $50,000 worth of damage, mostly to waterfront property. Presque Isle had 1600 phones out of commission. At Robinst a sardine factory was blown and washed into nearby St. Croix River, with damage of $300,000.
Philadelphia, Pa.	7-8					10			Snow, ice (glaze), and wind	Mixed snow and rain with freezing temperatures coate walks and highways with glaze, resulting in many traffic accidents and injuries to at least 10 person Wind blew slate shingles off roof, severing power lines, igniting gas line, and starting fire on building roof. Winds with gusts to 49 m.p.h. blew a freighter aground. Glaze-coated power lines broken in Plymouth Valley area, plunging area into darkness for 1 hour.
Washington County, Maine	8	1:30 a.m.					2,500		Electrical	At Millbridge, a fire, said to have been lightning-set, destroyed a landmark, "The Acre".
Gettysburg and Adams County, Pa.	8								Snow	Heavy snow in parts of Adams County blocked roads so that several schools had to close.
Seattle and vicinity, Wash.	8-10						250,000		Rain, accompanied by earthslides	Heavy rains, general in western Washington from 7th to 10th, and especially heavy on 8th and 9th, caused numerous destructive earthslides in steep hill residential areas of Seattle and surrounding towns. Many homes either partially or totally destroyed by sliding earth, rocks, and trees, and at least two residences on Vashon Island swept into Puget Sound. A number of homes in Alki Point area o West Seattle, as well as on Mercer Island, and shore of Lake Sammamish almost totally destroyed. Propert losses unusually high since many residences were large and of high value. All homes vacated in time, although many narrow escapes from death or injury reported. Some loss resulted also from flooded,low grounds, other than river floods in western Washington rivers which occurred at the same time.
Columbia, Pa	10								Ice jam	Ice jam at Washington Borough backed up water to raise level of Susquehanna River at Columbia 17 feet, and i undated Columbia Pumping Station with 5.5 feet of wat Some 20 families evacuated from low areas near Washin Borough. Factories shut down. Drinking water hauled i tank trucks until emergency pipe line was completed from nearby community.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Sun River, Mont.	10								Wind	Mostly soil blowing, damage to haystacks, and other minor inconveniences.
Massachusetts, coastal counties	10-11	5 p.m.-3 a.m.			5	See remarks			Snow	A minor storm development off Massachusetts coast, though of little energy, caused 1 to 3 inches of light, dry snowfall, which was responsible for a large number of skidding accidents, and at least 5 fatalities due to weather.
Missouri, southwestern portion	13-15	All day					$150,000		Ice(glaze) and sleet	Extensive storm damaged roofs, snapped telephone and power lines, and damaged timber and orchards. It destroyed one large building in Aurora, Lawrence County, demolishing several automobiles when the brick side walls collapsed. Factories, businesses and schools closed. Phone lines damage alone exceeded $70,000 in area of Jasper, Dade, Lawrence, Barry, Green, Christian, and Taney Counties, with Lawrence County suffering half of the total. Aggregate losses difficult to estimate since all of Missouri was covered by sleet or glaze to varying degrees, making driving hazardous and disrupting most business activities.
Arkansas, northern portion	13-15	Evening					See remarks		do	Highway traffic disrupted over much of area for up to a week, and many schools closed. Losses to timber estimated in excess of $100,000. Telephone and electric power services interrupted by broken wires and poles.
Eagle Pass area thence northeastward to the Red River Valley, Tex.	13-15								Ice	Although more extensive in area than storm which started in January, less damage was experienced. Heaviest damage from Huntsville to Paris.
Kentucky, northern portion	14				1	2			Sleet and ice (glaze)	Roads made almost impassable by ice coatings. A number of minor highway accidents and considerable property damage reported. Some glazing in other parts of State.
Livonia and vicinity, Mo.	15	All day					2,000		Ice(glaze)	Eastern quarter of Putnam County suffered damage to roofs, in addition to automobile accidents and tree damage.
Wisconsin, southern portion	16	Day				Several			do	Highways and walks very slippery in morning, and highway traffic badly disrupted. Several people injured by falling, or in auto accidents.
Blaine County, (southwest of Geary to 10 miles northeast), Okla.	19	4:30-5 p.m.	880	10			100,000		Hail and rain	Most damage in town of Geary. Damage to automobiles, roofs, street lights, windows, and greenhouse. Hail about 3/4 inch in diameter, a few up to 2 inches.
Vernon, Wilbarger County, Tex.	19	5 p.m.					2,000		Wind and hail	Damage to buildings. Hail light.
Caddo, Canadian, and Kingfisher Counties, Okla.	19	6:30-8p.m.	17 (at Ft. Reno)	45	0	5	33,000		Tornado and hail	There may have been more than one tornado, with funnel cloud dissipating and re-forming a number of times. Timing along a northeasterly path (40° azimuth) indicates only one tornado. Tornado funnel first struck in Spring Creek community 8 miles northeast of Gracemont, northern Caddo County where 5 persons were injured when 2 houses and 1 store were unroofed. Some farm buildings to the northeast in southern Canadian County damaged a short time later. The funnel then struck Fort Reno at 7:17 p.m. where $15,000 property damage to two buildings occurred. Equipment of cooperative weather station at Fort Reno demolished. As tornado proceeded in its northeasterly direction, it dipped down south of Okarche and then 6 miles east of Okarche between 7:30 and 8 p.m. Loss there estimated at $8,000. Some roofs in Okarche area damaged by hail. Damage by hail $500 included in total.
Beckham and Custer Counties, Okla.	19	8-9:30 p.m.	†10	50		1	42,000		Winds	Damage amounted to about $20,000 in Elk City area, $15,000 in Clinton area, $5,000 in Weatherford area, and $2,000 in Arapaho area; included in total. Also, numerous buildings unroofed or damaged, three oil well derricks in Elk City area blown down, freight box cars blown over in Clinton area. With this high wind generally over much of Beckham and Custer Counties, it is possible one or more tornadoes might have accompanied the storm. Several persons reported seeing funnel clouds at a number of places near Elk City and

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										near Arapaho, but these were not counted as tornado as there was no verifying evidence. It is believed these were ragged clouds that were mistaken for tornado funnels. All reported damage appeared to b from the high winds.
Cleveland County (4 miles south of Norman), Okla.	19	10-10:15 p.m.	100		0	0	$500		Tornado	Tornado hit the ground, then rose immediately; accompanied by light hail 1/2-inch in diameter. Path northeastward. One farm building blown down.
Seminole and Pottawatomie Counties, Okla.	19	10:30 p.m. to midnight					20,000		Wind	Damage in Seminole and Earlsboro. About two dozen buildings in all sections of city of Seminole damaged. Most damage in area 2 miles long and 3 block wide in northern edge of Seminole. No well defined path of destruction.
Mineral Wells Palo Pinto County, Tex.	19	11:45 p.m.					5,000		do	Damage to roofs, plate glass windows, and trees.
Denton, Denton County, Tex.	20	12:30 a.m.	50				5,000		Wind and hail	Several garages and barns of light construction blown over. Hail light.
Lonoke, Prairie, Monroe, Woodruff, Cross, and Poinsett Counties, Ark.	20	9:15 a.m.	†2	115	0	3	32,500	Small	Tornado	Storm first struck in vicinity of Keo, in Lonoke County, at 9:15 a.m. and progressed in a northeaster direction to beyond Marked Tree, where it dissipate Several homes and farm buildings either destroyed o damaged. In Brinkley winds toppled a wall in a burned-out building which crashed through roof of an adjoining store, severely injuring one person.
Kentucky, western portion	20	12 noon - 3 p.m.					*250,000	*	Wind (tornadic), rain, hail, and electrical	Windstorm described as a "small twister" in some localities. Hardest hit were Graves, Hickman, and McCracken Counties. Storm accompanied by hail and lightning in some areas. Trees uprooted and farm buildings blown down. At least two homes blown down and others unroofed. Several autos damaged. Telephone and electric services hampered.
Lowndes County, Miss.	20	3 p.m.		Short	0	0	12,000		Tornado	Appears to be separate from tornado in adjoining Oktibbeha County on same date.
Craig Springs, Oktibbeha County, Miss.	20	Mid-afternoon	Narrow	Short	1	1	5,000		do	Farm home and outbuildings destroyed.
Bankston, Ala.	20	4 p.m.	125	1	0	2	50,000		do	Fifteen buildings damaged; one building blown away. Telephone and power lines damaged considerably.
Bagdad, Shelly County, Ky.	20	6 p.m.	70	7	0	0	15,000	$700	do	Storm traveled northeastward and was of the bounding type. Several buildings destroyed, with damage to crops and livestock.
Atlanta-Decatur area, Ga.	20	9 p.m.					1,500		Electrical wind, and rain	High winds blew small objects into air that crashed into and broke several window panes; some damage done to two neon signs. Heavy rains flooded basements of several business houses in Atlanta; damage about $1,000. Lightning struck in Decatur on roof of an Agnes Scott College dormitory, opening a hole through which heavy rains poured through; damages about $500.
St. Louis County, Mo.	20	Evening					60,000		Wind and rain	Straight winds with 1 1/2 inches of rain broke plate glass windows, downed trees, and plucked shingles from roofs. Gusts reached 60 to 65 m.p.h. at St. Louis Weather Bureau Airport Station.
St. Clair, Madison, and Jersey Counties, Ill.	20	Evening					25,000		Wind	Strong winds damaged utility wires over much of East St. Louis, Alton, and surrounding communities. Wall of a new high school under construction at Bethalto, blown down.
Newbern, Tenn.	20								do	Barns unroofed and trees blown down 4 to 7 miles sout east of Newbern.
New Harmony (Fox Island), Ind.	20						2,000		do	
McKean and Mercer Counties, N. Dak.	26-27						20,000		Snow	Snowfall averaged 20 inches. Moderate to high winds caused drifts 10 feet deep. Hangar roof collapsed du to heavy snow in Mercer County. Roads blocked, and s livestock starved to death because they could not ge The Fifth Army sent "Weasels" early in March to ope roads, as some people had no food or fuel.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Southern Thomas, northeastern Logan and northwestern Gove Counties, Kans.	27	Night	†2	10					Hail	Light hail fell over a considerable area with greatest accumulation from near Monument, Logan County, to Halford, Thomas County. Hail ranged in size from small marbles to 3/4 inch in diameter.
Wisconsin, northwestern portion	28								Snow and wind	More than 6 inches of snow and high wind resulted in much drifting. Highway traffic paralyzed for a day by snow-blocked roads.
Wisconsin, eastern and southern portions	28					Several			Wind, electrical, and ice (glaze)	Lightning and high wind caused some disruption to electric power and communication lines. Several persons injured in traffic accidents attributed to slippery highways.

PRELIMINARY TOTALS BY STORM TYPES FOR FEBRUARY 1951

Type	Deaths	Injuries	Damage
Tornado	1	11	$ 172,200
Wind	1	1	1,207,000
Hail			75,500
Rain			1,563,000
Ice-sleet	29	420	68,839,425
Snow	5		20,000
Cold Wave	2		300
Electrical			3,000
Totals	38	432	$71,880,425

† Miles instead of yards.
‡ Yards instead of miles.
* Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

FEBRUARY 1951

Severe floods occurred in streams in western Washington between the 9th and 12th due to heavy precipitation and snow melt. Considerable damages resulted from the overflows in the lower reaches of the Nooksack, Snohomish, Skagit, Green and Stillaquamish basins but in most streams they were not as great as in December 1933.

Near record flooding occurred in some of the tributary streams in the Ohio Basin. The Kentucky River reached a near record stage at Hazard, Ky., and the Little Kanawha a near record stage at Glenville, W. Va. Extensive damage occurred along the Kentucky River but there was very little damage along the Little Kanawha.

A record low February stage was reached on the Missouri River at Kansas City, Mo., on the first day of the month.

ST. LAWRENCE DRAINAGE.--Moderate rains during the night of the 18th and 19th preceded by considerable snow melt on the 11th and 12th caused some flooding along the Grand River at Portland, Mich., on the 20th. The mild weather on the 11th and 12th reduced the snow cover by about 50 percent. Ice jam floods were a serious threat during this rise as there was considerable ice in the rivers. The ice jam at Portland gave way at noon on the 20th, at a crest of 14 feet, 2 feet above flood stage. The major damage was to the business section of the village of Portland and to dwellings in residential sections.

Minor flooding occurred along the Red Cedar and the Shiawassee between the 19th and the 21st due to rain on the 19th and 20th combined with snow melt. No damage was reported.

The flooding in the Lake Erie drainage was not particularly severe. It is difficult to separate the true flood damage from the more extensive spring break-up damage that occurred during the month. Although the rains were not unduly excessive, combined with moisture from previous melted snows and with some frozen soils it caused a very severe softening, not only in the open but under roads and pavements. Resulting damages, particularly to pavements and improved roads, has been estimated at several million dollars while the true flood damage was estimated at less than $50,000.

ATLANTIC SLOPE DRAINAGE.--The snow cover over the drainage basins in Maine was considerably more than during the same period last year. The ground water levels were high and the reservoirs were nearly full.

The ice began to break up in the rivers in New Hampshire during the last week of the month and all reaches of the Merrimack River below Franklin, N.H., were clear of ice by the end of the month. This is about two weeks ahead of the normal date.

There were numerous ice jams in the Mohawk basin throughout the month, especially from north of Amsterdam to Schenectady, N.Y. The river began to open up during the last 10 days of the month.

There was some flooding along the main stem of the Susquehanna River at Oneonta, N.Y., on the 2d, 22d and 23d and on the Chenango River on the 1st and 2d. The first overflows were due to heavy rain (1.6 inches) on a snow cover averaging between 2 and 3 inches with a water content of about 0.5 inch. The last overflow was due entirely to rain averaging around 0.9 inch. No damages resulted.

A critical water shortage developed at Columbia, Pa., on the 8th due to an ice jam in the lower Susquehanna. The borough water supply system was inundated due to backwater from the ice jam which was 8 miles in length, shutting off the water supply for 12,000 inhabitants and forcing the shutdown of factories and other commercial establishments. Normal water service was restored on the 17th after several days of above freezing temperatures and a 1.5-foot rise in the river due to rainfall which caused the ice to move. The Columbia-Marietta reach shows a rather high frequency of ice gorges and this was the second time in six years that the Columbia water supply was so affected. Damages resulting from the flood were relatively minor.

There was some flooding along the James River at State Farm, Va., on the 9th. No damages resulted.

EAST GULF OF MEXICO DRAINAGE.--The flooding along the Tombigbee and Warrior Rivers during February resulted from heavy precipitation on the 1st. Along the Warrior basin the rain averaged about 2 inches while in the headwaters of the Tombigbee the precipitation in the form of rain, sleet and snow averaged about 3 inches. This precipitation was followed by temperatures near zero which tended to distribute the runoff. Additional rains on the 7th, 9th and 10th affected the crests to some extent in the lower reaches. As no crops had been planted there was little loss to agricultural interests.

The flooding along the Pearl River basin resulted from heavy precipitation during the last three days of January and the 1st of February.

UPPER MISSISSIPPI BASIN.--Analysis of precipitation data covering the period Nov. 1, 1950 to Feb. 15, 1951, from approximately 150 cooperative weather stations in Wisconsin and Minnesota indicates that the season is below normal in the extreme upper Mississippi valley above Lock and Dam No. 10. Last season (1949-1950) was 12 percent above normal while the present season (1950-1951) is 7 percent below. However, there are two tributary drainage areas above normal, the Wisconsin River Valley being 29 percent above and the Minnesota River Valley 4 percent above. The past winter, although very cold, was characterized by a continuous snow blanket beginning Nov. 22d up through the end of February. This provided a check to any deep frost penetration into the ground so that there is very little frozen ground in marshy or wooded areas. The mild weather between the 14th and the 22d caused a gradual settling of the snow and the soil has taken up most of the moisture in ground water recharge. Even small streams have shown only slight rises in stage and practically no ice movement has been reported.

The following table shows the average precipitation during the period from Nov. 1 through Feb. 15 in the various drainage areas, as compared to the two former seasons. The average of all Minnesota stations during this period is 3.21 inches and for Wisconsin, 4.66 inches.

PRECIPITATION DATA FOR UPPER MISSISSIPPI BASIN

Nov. 1, 1950 through Feb. 15, 1951

Drainage Area	Normal	Season 1950-1951	Season 1949-1950	Season 1948-1949	Percent of Normal 1950-1951
Mississippi River	3.87	4.04	4.33	6.53	91
Chippewa River	4.23	3.58	5.10	5.21	84
Black River	4.20	3.73	4.16	5.37	89
St. Croix River	3.92	3.55	5.94	5.40	91
Zumbro-Whitewater	3.10	3.08	4.23	5.11	96
La Crosse River	4.50	4.14	4.33	5.87	92
Minnesota River	2.56	2.67	3.21	4.84	104
Wisconsin River	3.49	4.49	5.38	5.34	129
Root River	3.90	3.52	5.03	5.25	91

Warm weather over the southern portion of the basin during the latter half of February, together with moderate rainfall on the 17th, set off extensive snow melt over a large area and started widespread breakup of river ice. This situation was further aggravated by subsequent light to moderate rainfall which resulted in ice gorge formation in many tributaries. Severe local floods due to backwater from ice gorges occurred in the Turkey, Maquoketa, Little Maquoketa, Skunk and Wapsipinicon Rivers in Iowa and the lower Rock River. A levee broke on the Skunk River at Augusta, Iowa, flooding about 10,000 acres. Several families had to be evacuated from their homes. Damage to personal properties in the flooded areas was quite heavy.

The flooding in the Illinois, Osage, and Meramec basins during the second half of the month was due to moderate rains on the 15th and 16th together with some snow melt. A sharp rise occurred in the Mississippi. No damage resulted from the overflows.

MISSOURI BASIN.--Temperature played an important role in the river conditions during the month of February. During the last week of January a cell of continental polar air located just east of the Canadian Rockies began forcing a wedge of very cold air southeastward over the central states. On Jan. 27, the average temperature at Kansas City dropped to 21 degrees. It was not until the 4th of February that the average temperature rose to the freezing level. During this period of prolonged cold weather the flow from the Missouri River was reduced considerably. The Missouri River at Kansas City dropped to a stage of -0.64 foot at 10 a.m. on Feb. 1. This is the lowest February reading on record at Kansas City. The previous low February reading was 0.5 in 1947. The relationship between air temperature and river stage of the Missouri River at Kansas City, Mo., between Jan. 29 and Feb. 6 is shown by the chart at the end of this article.

On Feb. 24, following several days of above normal temperatures, the ice floes on the Missouri River began moving out from the area above St. Joseph, Mo., and through Nebraska City, Nebr. An ice gorge developed about 2-3 miles below the Nebraska City, Nebr., river gage during the evening of the 23d and the water above the gorge began backing very rapidly producing a stage of 18.3 feet by noon of the 24th. A moderate rain of 0.8 inch occurred during the night of the 24-25th which greatly assisted in breaking the ice gorge.

On the 12th a cold front approached the northwestern portion of Missouri and continued to move southeastward across the state with a series of minor waves moving northeastward along the frontal zone. The precipitation pattern resulting from this system was a mixture of snow, rain and freezing rain. Snow generally preceded the freezing rain.

Amounts of precipitation varied from about 0.33 inch over the upper portion of the Chariton River basin to about 1.75 inches over the Lamine River basin during the 4-day period between the 13th and 16th. The heaviest snow reported was at Clifton City where on the 15th a cover of 6.5 inches was reported. Rain began falling over central Missouri again on the 19th and continued through the 21st. Amounts during this period were lighter averaging about 0.25 inch over the upper Grand River basin to 1.25 inches over the lower Chariton River basin.

The overflow on the Chariton, Grand, and Lamine Rivers resulted from precipitation between the 13th and 16th and the 19th and 21st.

The flooding along the Republican River at Cambridge, Nebr., on the 11th was due to a local ice jam. No damage resulted from this overflow.

OHIO BASIN.--There were three rises in the Ohio basin during February. The first rise resulted from precipitation between Jan. 31 and Feb. 2. The storm was centered south of the Ohio basin with melted precipitation amounts up to 5.22 inches at Glasgow, Ky. Precipitation averaged about 3.5 inches over the Cumberland,Green, Kentucky, Licking, Sandy and Kanawha River basins. The first and last phases of the storm were ice glaze or snow in most all basins except the Sandy and Kanawha where it rained throughout.

The storm caused sharp rises on all the southern tributaries and along the main stem of the Ohio River. The Ohio River crested from 1 to 10 feet below flood stage due to runoff from this storm. Flood stages were exceeded on the Elk, Little Kanawha, Green, Cumberland and Tennessee Rivers with the most serious flooding occurring on the headwaters of the Kentucky and Cumberland Rivers. Although the Little Kanawha reached a near record stage at Glenville, W. Va., (31.3 feet) there was no loss of life nor much property damage.

Rain on the 7th and 8th produced moderate rises on the Hocking, Sandy, Cumberland and Green Rivers.

Snow melt on the 11th to 13th of the month provided one of the rare cases of appreciable rises due to snow melt with no complications caused by further precipitation. Rises resulted on all of the tributaries except those in West Virginia where there had been no snow cover. Flood stages were exceeded by 1-2 feet on the Hocking River, by 2-7 feet on the Scioto River, and by 1-7 feet on the Green River.

The Wabash and White Rivers reached 2-4 feet above flood stage on the upper reaches due to this snow melt. An ice jam just below Covington on the Wabash prevented the rise from moving downstream at this time, holding the water back until warm weather and additional rain on the 19th finally broke the ice jam after the stage at Covington had reached nearly 25 feet, 9 feet above flood stage.

Rain during the period of Feb. 19-22 caused the most severe flooding of the month. Storm totals of over 3 inches were observed in Indiana and Tennessee. Average amounts of about 2 inches were reported in Indiana, western Ohio, western Kentucky and northern Tennessee.

The Kentucky, Little Miami and Whitewater Rivers rose sharply to crests slightly below flood stages. The lower reaches of the Green River went 7-8 feet above flood stage, crests on the Scioto River were 3-4 feet above flood stages, and floods of major proportions occurred on the White and Wabash Rivers, where crests of 6-8 feet above flood stages were reported.

WHITE, ARKANSAS AND RED BASINS.--Moderate to heavy precipitation was general over the White, Arkansas and Red basins between the 13th and the 15th. These rains were followed by moderate to heavy rains beginning on the 17th and continuing through the 20th.

In the White basin the precipitation averaged near 2 inches over most areas during the first storm with a similar amount during the second storm. The flooding began along the main stem of the White River on the 21st and at all points except the extreme lower reaches by the 24th. The White remained above flood stage from Newport, Ark., to its mouth throughout the remainder of the month. Flood damage along the White River and tributaries was negligible except in the area between Newport and Georgetown, Ark.

In the Arkansas basin, there were sharp rises along the main stem of the river with a near bank-full stage reached at Dardanelle, Ark., but there were no overflows. Minor to moderate flooding occurred on the small streams that drain into the Arkansas between Muskogee, Okla.,and Van Buren, Ark.

Flooding in the Red Basin was mostly minor except in the Sulphur basin where it was more extensive. Monetary losses from the flooding will be small except at the Texarkana Dam, which was under construction.

LOWER MISSISSIPPI BASIN.--Moderate stages prevailed on the St. Francis River prior to the moderate rain (1.3 inches in the headwaters) on the 6th and 7th. This rain together with melting sleet and snow, caused the river to rise rapidly to above flood stage at Fisk, Mo., on the 9th and at St. Francis, Ark., on the 13th. It remained in flood the remainder of the month except at Fisk, Mo., between the 13th and 17th.

The ice and snow storm of late January and early February left 6-9 inches of snow and ice on the ground in northern Mississippi. Melting was quite slow because of the abnormally low temperatures which prevailed for the first two or three days following the storm. Some melting occurred on the 4th and 5th but there was still considerable accumulation on the ground when a moderate rain occurred on the 6th. As a result, the Coldwater at Sarah, Miss., rose 9 feet in 22 hours to crest slightly below 20 feet (1.85 feet above flood stage) on the 7th and the Tallahatchie at Swan Lake, Miss., rose almost 2 feet to crest at 29.1 on the 14th. The crest passed Greenwood, Miss., slightly above flood stage on the 16th. A period of moderate shower activity from the 14th to the 20th produced sufficient runoff to hold the rivers at levels near the crests for the balance of the month. At Yazoo City, Miss., the Yazoo was still rising slowly at the end of the month having reached the highest stage of the season on the 28th (4 feet above flood).

The heavy flow from the Ohio produced some flooding along the Mississippi at Caruthersville, Mo., and Memphis, Tenn. The Mississippi River at St. Louis, Mo., rose from -4.1 feet on the 3d (partially due to ice) to 22.4 feet on the 22d.

ATCHAFALAYA BASIN.--The Atchafalaya River continued in flood from Jan. 22 through the end of February except for a brief period between the 6th and 12th. No damage was reported.

WEST GULF OF MEXICO DRAINAGE.--The East Fork of the Trinity River exceeded flood stage slightly at Rockwall, Tex., on the 21st. No damage resulted.

Rains of about 0.50 inch over the Sabine basin during the first 2 weeks of the month caused temporary rises to near one-half bank-full during the second week. From the 13th to the 20th moderate to heavy rains averaging about 2 inches fell mostly over the upper Sabine. These caused slight flooding at Mineola and Gladewater, Tex., and large rises below during the last 10 days of the month.

CALIFORNIA COAST DRAINAGE.--Some flooding occurred along the Eel River at Fernbridge, Calif., on the 4th and 5th due to heavy rain on the 3d and 4th. The ground was completely saturated from previous heavy rain so runoff began immediately. Average rainfall during the 36 hours was about 5 inches, although some areas received as high as 8 inches of rainfall. The river began a noticeable rise during the night of the 3d reaching flood stage about 1:30 p.m. of the 4th. It continued above flood stage until 7:30 p.m. of the 5th. The damage from the overflow was light and was confined mostly to highways.

COLUMBIA BASIN.--Warm rains that began falling in eastern Washington and northern Idaho on the 7th caused considerable snow melt in the mountains and a flash flood on the Couer d'Alene River in the vicinity of Cataldo, Idaho. Outside of the loss of 2 lives only minor damages resulted.

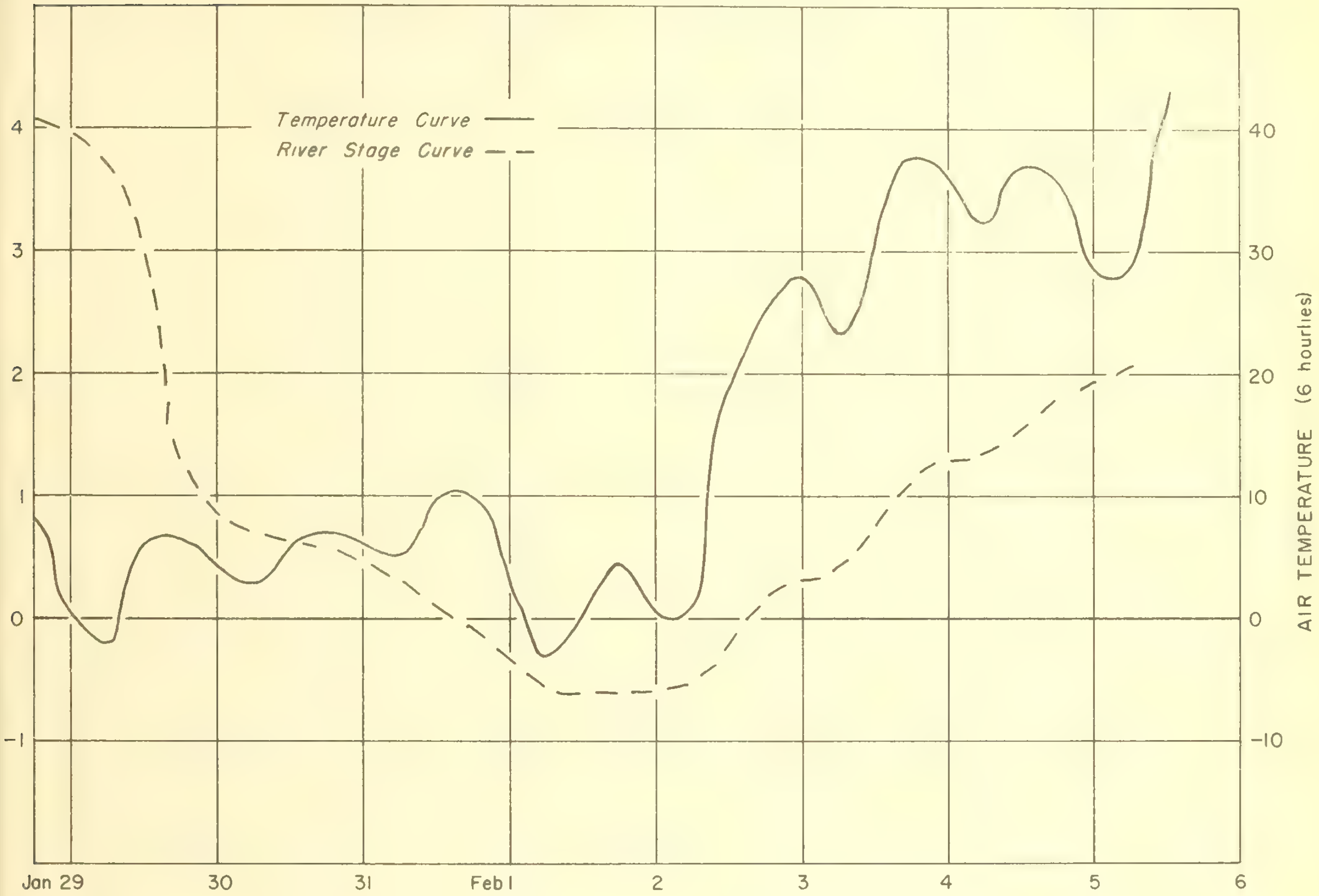
Minor flooding occurred again in the Willamette River at Harrisburg, Oreg., for the 5th consecutive month, in the lower Santiam at Jefferson, Oreg., and in the lower Willamette at Oregon City. Slight flooding also occurred in the Columbia below Vancouver, Wash. This freshet was due to daily light precipitation between the 2d and 11th together with some snow melt in the intermediate and higher elevations. This snow melt even extended into the upper Columbia and Snake River basins causing higher than average seasonal daily stages in the middle Columbia and lower Snake basins. Only minor damages resulted from the flooding.

PUGET SOUND AND WASHINGTON COAST DRAINAGE.--The worst floods in 30 years occurred in the Skagit and Snohomish valleys between the 9th and 12th of the month. The overflows in the Green River valley approached within 1.5 feet of the record flood of 1946. In the Chehalis River the flood crest exceeded the one in November 1949 by 3.6 feet but was 1.4 feet lower than the record stage of 18.4 feet in December 1937. In the Nooksack River, the flood crest approached within 0.5 foot of the 26.7-foot stage recorded at Deming, Wash., in November 1949. The Snoqualmie River rose to within 0.4 foot of the 59.9-foot record stage recorded in November 1932.

These severe overflows resulted from heavy rainfall during the period from the 6th through the 11th together with runoff from snow melt. The rainfall was excessively heavy on the 9th with several stations reporting amounts up to 4 inches. The greatest 24-hour amount reported was 6.28 inches at Snoqualmie Pass, Wash. Runoff from snow melt was an important contributing factor to these floods whereas in November 1949, snow melt was not an appreciable factor.

Heavy damages resulted from the severe overflows which have been estimated at between three and four million dollars. This was considerably more than in November 1949 and February 1932 but not as great as in December 1933.

TEMPERATURE AND RIVER STAGE DATA
Missouri River at Kansas City, Mo., 1951



FLOOD STAGE DATA

(All dates in February unless otherwise specified)

Table 5

FEBRUARY 1951

River and station	Flood stage	Above flood stages -dates		Crest *	
		From–	To–	Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE Lake Michigan					
Red Cedar:					
Williamston, Mich.	7	19	20	7.8	19
East Lansing, Mich.	8	20	21	8.7	20
Grand: Portland, Mich.	12	20	20	14.0	20
Lake Huron					
Shiawassee: Owosso, Mich.	7	20	20	7.2	20
Lake Erie					
St. Marys: Decatur, Ind.	13	12 21	12 27	13.8 18.6	12 23
St. Joseph: Montpelier, Ohio	10	14	28	13.8	22
Maumee:					
Fort Wayne, Ind.	15	19	26	19.1	24
Defiance, Ohio	10	21	24	12.6	23
Napoleon, Ohio	10	22	23	11.4	23
Sandusky: Upper Sandusky, Ohio	13	14	14	13.2	14
ATLANTIC SLOPE DRAINAGE					
Chenango: Sherburne, N.Y.	8	1	2	8.8	1
Susquehanna: Oneonta, N.Y.	12	2 22	2 23	14.9 12.7	2 22
James: State Farm, Va.	12	9	9	12.0	9
EAST GULF OF MEXICO DRAINAGE					
Black Warrior:					
Tuscaloosa Lock and Dam, Ala.	47	2	3	51.5	3
Tombigbee:					
Aberdeen, Miss.	34	2	11	38.5	8
Columbus, Miss.	29	4	10	32.2	6
Gainesville, Ala.	36	6	20	46.0	13
Lock No. 4, Demopolis, Ala.	39	3	28	51.3	11
Lock No. 3	33	2	†	52.9	11
Lock No. 2	46	5	28	53.9	13
Lock No. 1	31	6	†	36.2	17
Pearl:					
Edinburg, Miss.	20	5	12	21.6	7
Jackson, Miss.	18	1	28	30.2	12
Monticello, Miss.	15	7	25	19.1	18
Columbia, Miss.	17	13	23	18.1	20
Bogalusa, La.	15	1	†	19.1	22
Pearl River, La.	12	2	†	14.9	20
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Pecatonica: Freeport, Ill.	12	27	27	12.0	27
Rock: Moline, Ill.	10	19	†	12.7 14.6	24 25
Skunk: Augusta, Iowa	15	18	21	22.0	19
Fox: Wayland, Mo.	15	19	20	15.2	20
Salt: New London, Mo.	19	21	21	19.4	21
Illinois:					
Morris, Ill.	13	19	24	17.6	20
La Salle, Ill.	20	19	Mar. 6	25.5	20
Peoria, Ill.	18	21	†	21.2	23
Havanna, Ill.	14	19	†	19.3	24
Beardstown, Ill.	14	18	†	21.6	28
Meramec:					
Steelville, Mo.	12	19	19	13.4	19
Sullivan, Mo.	11	19	22	15.4 12.1	19 22
Pacific, Mo.	11	19	23	18.0	21
Valley Park, Mo.	14	19	24	21.0	21
Missouri Basin					
Republican: Cambridge, Nebr.	5	11	11	9.0	11
Grand: Sumner, Mo.	25	20	22	26.5	21
Chariton: Novinger, Mo.	20	19	22	24.2	20
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin (Cont'd.)	Ft.			Ft.	
Lamine: Clifton City, Mo.	15	19	22	24.3	21
Osage: Osceola, Mo.	22	21	23	23.9	22
Missouri: Nebraska City, Nebr.	15	24	25	18.3	24
Ohio Basin					
Tygart:					
Daily, W. Va.	9	1	2	10.4	1
Philippi, W. Va.	17	1	2	17.7	1
West Fork:					
Weston, W. Va.	17	1	2	19.0	1
Clarksburg, W. Va.	7	1	2	9.0	1
Monongahela:					
Lock No. 7, Greensboro, Pa. Upper gage	23	1	2	23.6	1
Lock No. 5, Brownsville, Pa. Upper gage	23	1	2	25.9	2
Lock No. 4, Charleroi, Pa. Upper gage	24	1	2	29.0	2
Lock No. 3, Elizabeth, Pa. Upper gage	23	1	2	25.4	2
Lock No. 2, Braddock, Pa. Upper gage	22	1	3	25.3	2
McKeesport, Pa.	12	1	3	15.6	2
Little Kanawha:					
Glenville, W. Va.	23	1	2	31.3	1
Creston, W. Va.	20	1	2	27.2	2
Hocking:					
Enterprise, Ohio	12	12	14	13.1 13.8	13
Athens, Ohio	17	14	14	17.3	14
Paint Creek: Bourneville, Ohio	10	12 21	14 23	14.8 13.6	13 21
Scioto:					
La Rue, Ohio	11	13 22	13 22	13.0 13.2	13 22
Prospect, Ohio	10	22	23	10.9	23
Circleville, Ohio	14	13 21	15 23	17.9 18.0	14 22
Chillicothe, Ohio	16	14 22	15 23	18.3 19.6	15 23
Piketon, Ohio	15	13	25	22.3 21.7	14 24
North Fork:					
Hazard, Ky.	20	1	1	27.3	1
Jackson, Ky.	29	1	2	41.3	2
Kentucky: Lock No.4, Heidelberg, Ky.	30	2	2	31.6	2
Barren: Bowling Green, Ky.	28	14	15	28.2	15
Green:					
Lock No. 6, Brownsville, Ky.	28	14	17	32.2	16
Lock No. 4, Woodbury, Ky.	33	3 8 13	5 11 26	35.4 34.4 40.2 38.8	4 10 16 23
Lock No. 2, Rumsey, Ky.	34	1	†	42.0	27
West Fork:					
Muncie, Ind.	--	--	--	9.7	21
Anderson, Ind.	10	21	23	16.6	22
Noblesville, Ind.	14	22	24	16.1	23
Spencer, Ind.	--	--	--	18.5	23
Elliston, Ind.	18	14	28	24.2	24
Newberry, Ind.	--	--	--	18.5	25
Edwardsport, Ind.	12	14	†	20.6	25
East Fork:					
Columbus, Ind.	--	--	--	11.7	22
Seymour, Ind.	14	21	24	17.1	22
Bedford, Ind.	--	—	--	25.5	25
Williams, Ind.	10	24	27	13.8	26
White: Petersburg, Ind.	16	16	†	22.8	28

FLOOD STAGE DATA

(All dates in February unless otherwise specified)

Table 5-Continued

River and station	Flood stage	Above flood stages -dates		Crest	
		From–	To–	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.)	Ft.			Ft.	
Ohio Basin (Cont'd.)					
Wabash:					
Bluffton, Ind.	10	21	24	13.4	23
Wabash, Ind.	12	13 19	13 25	13.0 18.2	13 21
La Fayette, Ind.	11	13	27	20.7	22
Covington, Ind.	16	13	28	24.6	18
Montezuma, Ind.	--	--	--	27.1	22
Terre Haute, Ind.	14	17	†	22.8	23
Hutsonville, Ill.	--	--	--	24.7	25
Riverton, Ind.	--	--	--	22.5	26
Vincennes, Ind.	16	21	†	23.4	28
Mount Carmel, Ill.	17	18	†	23.9	28
New Harmony, Ind.	15	21	†	19.1	28
New: New River, Tenn.	18	1	2	31.5	1
Cumberland:					
Williamsburg, Ky.	19	1 21	5 23	27.8 19.9	2 22
Lock F, Eddyville, Ky.	50	22	26	52.3	24
First Creek: Knoxville, Tenn.	5	1	2	7.9	1
Emory: Oakdale, Tenn.	23	1	1	26.9	1
Elk: Fayetteville, Tenn.	659	Jan. 31	1	666.7	1
Duck:					
Shelbyville, Tenn.	720.5	1	3	728.0	1
Columbia, Tenn.	32	1	4	36.5	3
Centerville, Tenn.	22	1	4	23.9	2
Tennessee:					
Whitesburg, Ala.	560	1	8	565.0	3
Florence, Ala.	18	1	7	21.6	3
Savannah, Tenn.	80	6	8	80.7	7
Gilbertsville, Ky.	34	1	†	44.3	26
Ohio:					
Tell City, Ind.	38	6 22	10 28	39.6 39.4	[illegible] 24
Dam No. 47, Newburgh, Ind.	38	6	†	42.5	24
Dam No. 48, near Henderson,Ky.	38	7	†	39.9 42.2	17 26
Mount Vernon, Ind.	35	8	†	37.2	11
Dam No. 49, Uniontown, Ky.	37	10	†	37.8	12
Shawneetown, Ill.	33	7	†	----	--
Dam No. 50, Fords Ferry, Ky.	34	6	†	----	—
Dam No. 51, Golconda, Ill.	40	21	Mar. 8	43.7	28
Paducah, Ky.	39	9 21	12 Mar. 8	39.9 42.8	11 26
Dam No. 52, Brookport, Ill.	37	6	Mar. 16	41.6 44.8	11 26
Dam No. 53,near Mound City,Ill.	42	8	†	45.0 50.3	11 25
Cairo, Ill.	40	9 19	14 †	41.3 49.0	12 26
White Basin					
Black:					
Poplar Bluff, Mo.	16	21	21	16.8	21
Black Rock, Ark.	14	19	†	23.1	22
Little Red: Judsonia, Ark.	30	—	--	33.3	22
White:					
Calico Rock, Ark.	19	21	21	24.6	21
Batesville, Ark.	23	21	24	29.6	21
Newport, Ark.	26	22	Mar. 3	28.5	23
Augusta, Ark.	32	23	Mar. 13	33.6	27
Georgetown, Ark.	21	23	†	24.7	Mar. 1
Des Arc, Ark.	24	25	†	27.8	Mar. 2
Clarendon, Ark.	26	24	†	29.9	Mar. 5
St. Charles, Ark.	25	27	†	----	--

River and station	Flood stage	Above flood stages -dates		Crest	
		From–	To–	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.)	Ft.			Ft.	
Arkansas Basin					
Deep Fork: Dewar, Okla.	18	21	22	19.3	21
Red Basin					
Ouachita:					
Arkadelphia, Ark.	17	16 21	18 23	19.9 21.6	16 21
Camden, Ark.	26	18	Mar. 2	33.4	26
Little:					
Horatio, Ark.	21	--	--	29.1 29.5	17 20
Whitecliffs, Ark.	25	18	26	27.2	22
Sulphur:					
Hagansport, Tex.	38	7 16 19	7 17 24	42.0 39.6 40.2 40.4	7 16 19 21
Naples, Tex.	22	11 18	14 Mar. 2	24.6 27.8	12 22
McCartney Bridge, Tex.	22	--	--	27.6	26
Cypress: Jefferson, Tex.	18	25	28	18.9	26
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.	20	9 17	13 †	21.6 24.0	10 24-25
St. Francis, Ark.	18	13	†	19.1 21.1	16-17 25-26
Coldwater: Sarah, Miss.	18	[illegible]	7	19.9	7
Tallahatchie: Swan Lake, Miss.	26	Jan. 5	†	29.4 29.1 29.4	Jan. 10 Jan.16-17 23
Yazoo:					
Greenwood, Miss.	35	13	23	35.6	16
Yazoo City, Miss.	29	Jan. 22	†	33.3	28
Mississippi:					
New Madrid, Mo.	34	22	Mar. 14	38.5	27
Caruthersville, Mo.	32	22	†	----	--
Memphis, Tenn.	34	27	†	----	--
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La.	25	Jan. 22 13	5 †	25.8 ----	1-3 --
WEST GULF OF MEXICO DRAINAGE					
Sabine:					
Mineola, Tex.	14	19	28	16.6	24
Gladewater, Tex.	26	26	Mar. 2	28.0	Mar. 1
East Fork: Rockwall, Tex.	10	21	21	11.7	21
PACIFIC SLOPE DRAINAGE					
Eel Basin					
Eel: Fernbridge, Calif.	17.5	4	5	21.3	5
Columbia Basin					
Coeur d'Alene: Cataldo, Idaho	43	10	12	45.0	12
Santiam: Jefferson, Oreg.	13	7 11	8 13	14.7 15.2	8 11
Willamette:					
Harrisburg, Oreg.	12	5	9	13.8	8
Oregon City, Oreg.	12	10	10	12.0	10
Columbia: Vancouver, Wash.	15	12	15	16.2	13
Chehalis Basin					
Skookumchuck: Centralia, Wash.	68	9	13	72.6	10
Chehalis:					
Centralia, Wash.	63	9	12	69.2	10
Grand Mound, Wash.	14.5	9	12	17.0	10
PUGET SOUND AND WASHINGTON COAST DRAINAGE					
Green: Auburn, Wash.	63	9	12	67.0 66.6	10 11
Snoqualmie: Tolt, Wash.	51.5	9	13	59.5	10
Snohomish: Snohomish, Wash.	23.6	9	13	30.2	10
Stillaquamish: Arlington, Wash.	16	9	11	19.2	10
Skagit:					
Concrete, Wash.	26	9	12	39.0	10
Mt. Vernon, Wash.	22	9	12	28.7	11
Nooksack: Deming, Wash.	25	9	10	26.2	10

* Provisional.
† Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

Standard pressure surface (mb.)	ALBANY, N. Y (1011 MB.)				ALBUQUERQUE, N. MEX (838 MB.)				ATLANTA, GA. (987 MB.)				BIG SPRING, TEX. (927 MB.)				BISMARCK, N. DAK. (958 MB.)				BOISE, IDAHO (916 MB.)				BROWNSVILLE, TEX. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	86	- 3.4	76	28	1,620	4.9	46	28	307	7.0	70	28	784	9.5	47	28	505	-12.3	84	27	868	2.1	74	28	6	15.1	84
1,000--	28	174			28	145			28	194			28	140			28	173			27	156			28	160	15.6	77
950----	28	582	- 3.8	68	28	580			28	623	8.2	60	28	574			28	572			27	580			28	600	13.4	72
900----	28	1,005	- 4.9	66	28	1,035			28	1,064	7.1	60	28	1,026	11.1	40	28	987	- 7.5	67	27	1,014	3.9	61	28	1,049	12.8	57
850----	28	1,454	- 5.5	64	28	1,500			28	1,534	5.9	57	28	1,501	8.7	38	28	1,433	- 6.0	59	27	1,476	1.2	60	28	1,529	12.4	45
800----	28	1,930	- 5.3	57	28	1,996	4.2	38	28	2,029	4.2	51	28	2,000	6.3	36	28	1,909	- 5.7	51	27	1,961	- 1.7	60	28	2,036	11.1	37
750----	28	2,442	- 6.7	51	28	2,526	1.2	39	28	2,561	2.4	43	28	2,535	3.8	37	28	2,422	- 6.9	51	27	2,475	- 4.6	57	28	2,582	9.8	
700----	28	2,972	- 9.3	49	28	3,069	- 2.4	42	28	3,108	0.3	38	28	3,084	1.1	34	28	2,949	-10.0	51	27	3,012	- 7.5	58	28	3,143	7.3	
650----	28	3,549	-11.3	46	28	3,656	- 6.1	45	28	3,706	- 3.0	38	28	3,684	- 2.2	35	28	3,529	-13.7	51	27	3,591	-10.9	57	28	3,756	3.4	
600----	28	4,155	-14.3		28	4,276	-10.0	44	28	4,328	- 6.6	34	27	4,308	- 6.4	35	26	4,121	-17.7	51	26	4,195	-14.9	53	28	4,391	- 0.9	
550----	28	4,812	-18.0	41	28	4,943	-14.4	41	28	5,005	-11.2	34	26	4,987	-11.0		26	4,776	-21.8	46	26	4,852	-19.1	48	28	5,083	- 6.1	
500----	28	5,515	-22.4		28	5,657	-18.8	37	28	5,723	-16.1	36	25	5,715	-15.6		26	5,462	-26.4	44	24	5,552	-24.3	48	28	5,817	-11.7	
450----	28	6,286	-27.7		28	6,438	-24.3	38	28	6,520	-21.2		25	6,502	-21.5		26	6,221	-31.8	43	24	6,313	-29.4	51	27	6,620	-18.2	
400----	28	7,117	-33.9		28	7,283	-30.5	39	28	7,370	-27.8		25	7,359	-28.5		25	7,035	-38.0		24	7,144	-35.0		27	7,482	-24.9	
350----	28	8,038	-40.7		27	8,214	-36.8		27	8,316	-35.0		24	8,298	-35.5		25	7,941	-44.6		24	8,062	-41.4		27	8,439	-32.0	
300----	28	9,071	-47.7		27	9,265	-43.9		26	9,379	-43.0		23	9,350	-43.4		24	8,953	-51.7		23	9,099	-47.8		27	9,508	-40.5	
250----	25	10,272	-54.8		27	10,467	-51.6		26	10,583	-52.2		22	10,554	-51.8		24	10,120	-56.7		23	10,285	-53.8		27	10,726	-49.1	
200----	23	11,684	-57.8		27	11,892	-57.2		26	12,002	-58.1		20	11,975	-57.4		22	11,514	-56.4		23	11,703	-57.3		26	12,169	-56.2	
175----	21	12,525	-57.3		26	12,734	-58.1		26	12,840	-58.8		19	12,801	-59.6		22	12,363	-55.2		23	12,550	-55.8		26	13,011	-59.9	
150----	20	13,499	-56.5		25	13,703	-59.3		26	13,801	-60.9		13	13,752	-61.0		20	13,333	-55.8		23	13,528	-56.1		26	13,964	-63.2	
125----	17	14,643	-57.8		25	14,838	-61.8		24	14,916	-63.5		12	14,871	-63.1		19	14,504	-56.9		22	14,684	-57.6		26	15,075	-67.4	
100----	17	16,041	-59.9		24	16,205	-64.8		23	16,273	-66.7		10	16,226	-68.1		19	15,911	-58.4		19	16,093	-59.4		26	16,398	-73.0	
80-----	13	17,420	-60.6		22	17,552	-66.5		20	17,620	-68.5		6	17,541	-69.8		19	17,310	-59.3		15	17,500	-61.0		22	17,699	-74.4	
60-----	7	19,221	-59.5		18	19,308	-65.7		13	19,342	-64.9						12	19,160	-59.1		10	19,293	-60.3		15	19,384	-69.1	
50-----	5	20,348	-58.9		11	20,425	-63.9		8	20,475	-63.8						8	20,302	-60.1		5	20,435	-58.1		11	20,490	-64.6	
40-----					3	21,836	-60.4																		7	21,869	-60.1	
30-----																												

Standard pressure surface (mb.)	BUFFALO, N. Y. (995 MB.)				BURRWOOD, LA. (1022 MB.)				CAMAGUEY, CUBA (1005 MB.)				CARIBOU, MAINE (997 MB.)				CHARLESTON, S. C (1022 MB.)				CIUDAD VICTORIA, MEX. (976 MB.)				COLUMBIA, MO. (991 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	221	- 3.2	78	28	3	11.8	93	25	122	17.5	89	28	191	- 9.5	73	28	13	7.8	79	26	335	22.1	39	28	239	1.0	73
1,000--	28	180			28	183	15.6	72	25	169	18.1	85	28	164			28	195	11.3	62	26	124			28	166		
950----	28	595	- 3.6	71	28	619	12.9	64	25	613	17.3	77	28	569	- 7.7	67	28	628	10.0	53	26	572	20.0	42	28	583	1.3	66
900----	28	1,013	- 4.5	69	28	1,069	10.6	62	25	1,069	14.3	78	28	984	- 8.0	62	28	1,072	8.3	48	26	1,033	16.4	48	28	1,015	1.3	64
850----	28	1,463	- 4.9	61	28	1,544	9.0	55	25	1,551	12.7	65	28	1,428	- 7.7	61	28	1,542	6.6	42	26	1,517	13.2	54	28	1,475	0.7	62
800----	27	1,945	- 5.2	58	28	2,045	7.9	42	25	2,059	11.5	43	28	1,899	- 8.0	60	28	2,038	4.6	38	26	2,025	12.1	48	28	1,960	- 0.8	61
750----	27	2,458	- 6.9	54	28	2,583	6.0	35	25	2,604	9.3	34	28	2,408	- 8.8	56	28	2,571	2.6	33	26	2,575	10.8	36	28	2,478	- 2.8	58
700----	27	2,987	- 9.0	55	28	3,138	3.8	28	25	3,166	6.4		28	2,934	-10.4	57	28	3,118	0.3	31	26	3,139	8.5	27	28	3,019	- 5.1	58
650----	27	3,567	-11.6	53	28	3,742	0.5		25	3,780	3.4		28	3,510	-13.0	53	28	3,715	- 2.8	34	25	3,751	4.5	28	28	3,604	- 7.9	53
600----	27	4,167	-14.9	51	28	4,374	- 3.5		24	4,416	- 0.9		28	4,108	-16.0	48	28	4,339	- 6.5	33	25	4,393	- 0.2	27	28	4,216	-11.4	50
550----	26	4,830	-18.4	48	28	5,056	- 8.1		24	5,109	- 5.5		28	4,766	-19.[illegible]	46	28	5,014	-10.9	31	24	5,084	- 5.0		28	4,884	-15.4	47
500----	26	5,529	-22.7	45	28	5,788	-13.4		23	5,846	-10.3		28	5,459	-24.6	47	28	5,738	-15.8		24	5,825	-10.8		28	5,592	-20.1	45
450----	25	6,304	-28.3	44	28	6,583	-19.6		23	6,656	-15.9		28	6,221	-29.7	46	28	6,530	-21.5		21	6,630	-17.3		28	6,368	-25.6	45
400----	24	7,136	-34.7		28	7,444	-26.3		23	7,527	-22.4		28	7,050	-35.5	47	28	7,382	-28.2	30	21	7,498	-23.3		28	7,208	-31.6	43
350----	23	8,065	-41.0		28	8,396	-33.3		23	8,495	-29.4		28	7,967	-41.8		28	8,326	-35.4	32	20	8,462	-30.7		28	8,139	-38.7	
300----	23	9,097	-48.3		28	9,460	-41.5		23	9,577	-37.4		28	8,995	-48.7		28	9,380	-43.7		20	9,538	-38.7		28	9,179	-46.4	
250----	22	10,294	-55.0		28	10,673	-50.2		23	10,814	-46.3		27	10,187	-55.3		28	10,579	-53.0		20	10,767	-47.4		28	10,369	-53.9	
200----	18	11,691	-57.6		28	12,104	-57.5		23	12,265	-55.7		24	11,587	-57.1		28	11,995	-58.0		19	12,214	-56.0		28	11,782	-58.3	
175----	17	12,545	-57.2		26	12,949	-60.3		23	13,106	-60.4		22	12,429	-55.5		27	12,840	-58.9		19	13,055	-60.5		28	12,622	-58.2	
150----	15	13,542	-56.6		25	13,912	-63.0		23	14,057	-65.0		21	13,407	-55.1		27	13,803	-60.5		19	14,006	-63.7		27	13,588	-58.8	
125----	11	14,684	-57.5		25	15,024	-66.7		22	15,156	-70.2		17	14,556	-56.6		23	14,927	-63.6		14	15,118	-68.3		26	14,724	-60.4	
100----	8	16,080	-58.6		24	16,358	-71.4		19	16,475	-75.2		15	15,958	-57.5		22	16,282	-67.2		9	16,441	-73.8		22	16,112	-62.4	
80-----	6	17,465	-60.7		21	17,668	-73.3		19	17,758	-77.2		10	17,357	-57.5		15	17,605	-67.6						20	17,485	-64.1	
60-----					15	19,364	-69.1		11	19,426	-71.2		7	19,189	-55.6		9	19,319	-64.3						8	19,262	-62.6	
50-----					10	20,455	-65.5		7	20,501	-65.5						5	20,460	-62.6						6	20,435	-61.8	
40-----					7	21,829	-60.6																					

Standard pressure surface (mb.)	DODGE CITY, KANS. (925 MB.)				EL PASO, TEX. (882 MB.)				ELY, NEV. (807 MB.)				GLASGOW, MONT. (940 MB.)				GRAND JUNCTION, COLO (0853 MB.)				GREAT FALLS, MONT. (0885 MB.)				GREENSBORO, N. C. (991 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	792	1.8	65	28	1,195	9.3	47	28	1,908	- 1.2	56	28	648	-12.2	77	28	1,474	- 1.5	69	28	1,128	- 4.7	61	28	273	4.0	69
1,000--	28	153			28	136			28	156			28	172			28	179			28	152			28	196		
950----	28	575			28	575			28	583			28	574	-		28	603			28	569			28	617	5.7	51
900----	28	1,016	4.2	55	28	1,030			28	1,027			28	987	- 7.3	64	28	1,043			28	997			28	1,058	4.7	51
850----	28	1,480	3.4	49	28	1,503	10.0	38	28	1,490			28	1,433	- 6.1	56	28	1,497			28	1,445	- 3.2	50	28	1,522	2.8	52
800----	28	1,971	2.1	47	28	2,004	7.1	40	28	1,980			28	1,907	- 6.1	55	28	1,985	0.4	50	28	1,923	- 4.9	52	28	2,011	0.9	50
750----	28	2,494	- 0.0	45	28	2,537	4.2	40	28	2,501	- 1.2	46	28	2,416	- 7.8	56	28	2,506	- 1.8	46	28	2,431	- 6.6	54	28	2,535	- 0.7	46
700----	28	3,039	- 2.6	41	28	3,090	1.1	40	28	3,043	- 5.1	49	28	2,944	-10.8	57	28	3,046	- 5.1	47	28	2,965	- 9.7	53	28	3,078	- 2.7	40
650----	28	3,626	- 6.2	42	28	3,686	- 2.7	37	28	3,624	- 8.7	51	28	3,517	-14.1	57	28	3,629	- 8.7	49	28	3,540	-13.4	52	28	3,665	- 5.5	37
600----	28	4,244	-10.3	42	28	4,311	- 7.0	34	28	4,238	-12.7	49	28	4,112	-17.5	52	28	4,239	-12.7	50	28	4,137	-17.1	44	28	4,287	- 8.9	
550----	28	4,911	-15.1	41	28	4,988	-11.1	30	28	4,897	-16.8	45	28	4,762	-21.8	50	28	4,902	-17.0	48	27	4,787	-21.4	41	28	4,955	-12.9	33
500----	28	5,621	-20.0	40	28	5,709	-15.9		28	5,606	-21.7	42	28	5,454	-26.8	46	28	5,606	-21.9	47	27	5,480	-26.3	42	28	5,675	-17.9	33
450----	28	6,396	-25.3	39	27	6,500	-21.2		28	6,376	-27.1	40	28	6,209	-32.2	43	28	6,373	-27.2	45	27	6,237	-31.8	43	28	6,455	-23.6	
400----	28	7,240	-31.2	40	26	7,356	-27.7		28	7,213	-33.1		28	7,027	-38.1		28	7,212	-32.9	42	27	7,056	-37.7		28	7,305	-30.1	
350----	28	8,173	-37.7		26	8,302	-34.5		28	8,139	-39.3		28	7,933	-44.4		28	8,138	-39.3		26	7,954	-44.2		28	8,241	-37.0	
300----	28	9,218	-45.4		26	9,361	-42.5		28	9,179	-46.0		28	8,951	-50.7		28	9,177	-46.6		26	8,972	-50.7		28	9,289	-44.6	
250----	28	10,413	-53.0		25	10,561	-51.2		27	10,384	-53.5		28	10,124	-55.5		28	10,365	-54.1		20	10,152	-55.8		28	10,487	-52.7	
200----	27	11,831	-57.8		23	11,991	-56.4		27	11,801	-57.8		27	11,540	-56.5		26	11,784	-57.3		17	11,552	-55.7		27	11,921	-57.7	
175----	27	12,671	-58.0		23	12,835	-57.9		26	12,638	-57.7		27	12,389	-55.3		26	12,626	-57.7		17	12,402	-54.8		24	12,755	-58.2	
150----	27	13,639	-59.0		22	13,803	-59.5		26	13,608	-58.4		25	13,385	-54.8		26	13,597	-57.7		16	13,380	-54.1		24	13,721	-59.6	
125----	26	14,777	-60.5		20	14,930	-63.5		26	14,751	-59.5		25	14,548	-55.9		26	14,741	-59.5		14	14,533	-55.0		23	14,852	-61.7	
100----	25	16,154	-62.9		20	16,288	-66.7		25	16,132	-61.7		24	15,965	-56.8		26	16,129	-62.0		10	15,939	-55.8		22	16,229	-64.2	
80-----	19	17,541	-64.2		19	17,634	-69.4		18	17,518	-62.4		23	17,384	-58.3		23	17,504	-63.6		9	17,343	-56.6		22	17,590	-65.2	
60-----	12	19,333	-64.0		15	19,357	-67.6		12	19,302	-60.3		16	19,170	-59.5		11	19,291	-61.9						11	19,355	-64.1	
50-----	7	20,462	-61.6		11	20,471	-64.3		8	20,435	-59.1		13	20,364	-58.0		5	20,424	-61.6						9	20,466	-61.5	
40-----					7	21,830	-59.9		5	21,843	-56.7		7	21,779	-58.4													

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

FEBRUARY 1951

Standard pressure surface (mb.)	HATTERAS, N. C (1022 MB.)				HAVANA, CUBA (1014 MB.)				HILO, T H (1013 MB)				INTERNAT. FALLS, MINN (976 MB.)				JOLIET, ILL (1000 MB)				LAKE CHARLES, LA (1021 MB.)				LANDER, WYO (826 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	3	7.7	84	28	49	19.4	76	28	9	22.8	78	27	361	-12.2	75	28	179	- 4.2	73	28	5	11.5	87	28	1,696	- 2.2	54
,000--	28	183	9.6	69	28	173	19.5	74	28	123	21.8	78	27	175			28	174			28	175	12 1	80	28	143		
950----	28	614	8.2	60	28	616	16.2	76	28	569	18.4	81	27	571	-10.6	73	28	584	- 3.6	20	28	609	11.1	74	28	566		
00----	28	1,053	6.0	56	28	1,070	13.4	71	28	1,029	15.2	84	27	983	-11.4	72	28	1,008	- 2.3	58	28	1,055	9 6	67	28	1,009		
50----	28	1,520	4.1	51	28	1,550	11.4	59	28	1,512	12.9	76	27	1,423	- 9.6	67	28	1,462	- 2.6	52	28	1,529	8 3	54	28	1,465		
00----	28	2,011	2.4	46	28	2,056	10.1	43	28	2,021	10.9	67	27	1,891	-10.0	61	28	1,942	- 4.0	49	28	2,029	7.1	46	28	1,952	- 0.4	47
750----	28	2,536	- 0.2	44	28	2,597	9 4		28	2,565	8.4	61	27	2,393	-11.4	56	28	2,454	- 6.0	50	28	2,571	6.1		28	2,471	- 2 9	43
700----	28	3,080	- 2.3	39	28	3,161	6.8		28	3,125	5.3	55	27	2,915	-12.8	56	28	2,987	- 8 4	53	28	3,121	3 7		28	3,009	- 6.2	45
50----	28	3,671	- 5 4		28	3,772	3.2		28	3,731	2.1	44	27	3,484	-15.7	52	28	3,568	-10.5	52	28	3,725	0 5		28	3,591	-10 1	42
00----	27	4,292	- 8.8	42	28	4,410	- 1 0		28	4,370	- 1.4	39	27	4,076	-18.7	46	28	4,171	-13.9	51	28	4,356	- 3.2		28	4,197	-14.1	39
50----	27	4,963	-12 9	38	28	5,100	- 5.7		27	5,060	- 5 8	37	27	4,724	-22.8	44	28	4,830	-18 3	48	28	5,043	- 7 7		28	4,857	-18 6	38
00----	27	5,680	-17.8		28	5,839	-10 7		27	5,799	-10 5	35	27	5,412	-27 3	44	27	5,536	-22.9	46	27	5,771	-13 3		28	5,555	-23.6	39
50----	27	6,463	-23.6		28	6,646	-16.7		27	6,608	-15 9	34	27	6,165	-32.7	10	27	6,308	-27.9	47	27	6,569	-19 6		28	6,322	-29 1	40
00----	27	7,309	-30.2		28	7,515	-23 5		27	7,480	-22.0	36	27	6,981	-38.6		27	7,137	-33.7	48	27	7,427	-26.2		28	7,149	-35.3	37
50----	27	8,246	-37 4		28	8,477	-30.4		27	8,448	-29 2	36	27	7,884	-45 3		26	8,063	-39 8		27	8,377	-33.5		28	8,066	-41 9	
00----	25	9,295	-44.6		28	9,554	-38 6		27	9,532	-37.1		27	8,897	-52.2		24	9,090	-47.2		26	9,443	-41 2		28	9,093	-48.6	
50----	25	10,493	-52.6		28	10,783	-47.1		27	10,767	-46 3		27	10,060	-57.6		22	10,270	-54.1		25	10,661	-49 6		28	10,273	-55 1	
00----	24	11,910	-57.8		28	12,230	-55.8		27	12,220	-55.2		25	11,452	-56.7		21	11,680	-57.0		25	12,094	-57 0		27	11,676	-58.2	
75----	24	12,750	-58.4		28	13,072	-60.0		24	13,069	-59.5		24	12,293	-54.9		21	12,525	-56.6		24	12,941	-60.3		27	12,519	-56 5	
50----	23	13,717	-59.7		28	14,023	-64.5		22	14,020	-64.6		21	13,273	-55.2		20	13,492	-57.1		24	13,895	-62 8		27	13,496	-56 6	
25----	22	14,846	-61.8		25	15,131	-69.4		18	15,112	-69 5		20	14,433	-56.1		20	14,641	-58.6		24	15,010	-65.7		27	14,649	-57 8	
00----	20	16,215	-64.5		20	16,439	-74.8		12	16,435	-73.9		17	15,845	-57.0		19	16,048	-60.4		23	16,357	-69 7		26	16,053	-59 6	
0-----	16	17,598	-66.2		19	17,728	-76.9		9	17,727	-76.1		11	17,208	-57.7		16	17,431	-61.9		22	17,679	-71.8		21	17,443	-59 9	
0-----	12	19,360	-64.4		13	19,428	-70.5		6	19,406	-70.6		5	19,039	-59.5		7	19,168	-61.2		17	19,389	-69 6		18	19,242	-59 0	
0-----	9	20,481	-62.3		11	20,522	-64.4		5	20,508	-66.3										15	20,486	-66.4		11	20,386	-59 2	
0-----	6	21,847	-59.8		6	21,863	-60.7														12	21,837	-62.9		5	21,812	-58 5	
0-----																					7	23,620	-60.1					
0-----																					5	26,119	-57 3					

	LAS VEGAS, NEV (939 MB.)				LITTLE ROCK, ARK. (1012 MB)				MAZATLAN, MEXICO (1012 MB.)				MEDFORD, ORE. (970 MB.)				MERIDA, MEXICO (1015 MB.)				MIAMI, FLA. (1021 MB.)				NANTUCKET, MASS. (1019 MB)			
URFACE	28	660	9.1	35	28	79	6.8	71	22	14	20.1	79	28	401	5.6	88	28	27	22 6	64	28	4	17.6	99	27	14	0 4	83
,000--	28	133			28	174	6.9	66	22	114	19.5		28	147			28	155	21.9	63	28	183	17.8	71	27	166	1.5	76
50----	28	563			28	599	6.1	62	22	565	21.1		28	571	6.5	75	28	604	19 7	60	28	621	14 9	73	27	579	- 0.0	72
00----	28	1,015	10.8	26	28	1,039	6.0	57	22	1,024	20.2		28	1,011	4.9	67	28	1,064	16.7	63	28	1,077	12.3	68	27	1,010	- 1 6	66
50----	28	1,488	7.7	29	28	1,507	5.1	55	22	1,515	17.7		28	1,475	1.9	68	28	1,548	13.2	67	28	1,554	10 6	50	27	1,465	- 2.1	55
00----	28	1,985	4.6	33	28	2,000	3.5	50	22	2,030	14.6		28	1,962	- 1.2	70	28	2,056	11.1	53	28	2,058	9.2	36	27	1,946	- 2 9	57
50----	28	2,508	1.2	36	28	2,529	2.2	42	22	2,578	11.2		28	2,478	- 4.5	68	28	2,601	10.2		28	2,595	7 3	26	27	2,459	- 4 7	58
00----	28	3,058	- 1.9	38	28	3,077	- 0.3	38	22	3,144	7.5		28	3,014	- 7.5	61	28	3,165	8 0		28	3,156	5 1		27	2,997	- 6 8	56
50----	27	3,644	- 5.5	36	28	3,670	- 3 5	37	22	3,756	3.4		28	3,595	-10.6	55	28	3,782	4.5		28	3,762	1 9		27	3,576	- 9 2	51
00----	27	4,264	- 9.4	37	28	4,295	- 7 0	37	22	4,395	- 0.9		27	4,196	-14.5	49	28	4,419	0.4		28	4,397	- 2.3		27	4,188	-12 6	47
50----	27	4,933	-14.1	34	28	4,970	-11.1	33	22	5,085	- 5.7		27	4,856	-19 0	47	28	5,111	- 4.7		28	5,082	- 7 1		27	4,851	-16.6	48
00----	27	5,646	-19 4	36	28	5,693	-16 1		22	5,821	-11.2		27	5,552	-23.8	46	28	5,852	-10.3		28	5,818	-12.1		26	5,561	-21.1	50
50----	27	6,423	-24.9		28	6,480	-21.8		22	6,626	-17.3		27	6,316	-29.2	45	28	6,664	-16.3		28	6,624	-17.8		26	6,332	-26.6	48
00----	26	7,260	-31.2		28	7,334	-28.4	39	22	7,494	-23.9		27	7,146	-34.8		28	7,532	-22.8		28	7,486	-24.6		26	7,171	-33 0	46
50----	26	8,194	-37.7		28	8,277	-35.6	43	22	8,454	-31.2		27	8,064	-41.6		28	8,496	-30.0		28	8,443	-32 2		26	8,097	-39 8	
00----	26	9,241	-44.7		28	9,331	-43.6		22	9,527	-39.2		26	9,091	-47.9		28	9,574	-38.4		28	9,512	-40 3		26	9,133	-47 4	
50----	26	10,441	-51.9		28	10,532	-52.3		22	10,753	-47.2		26	10,277	-53.4		28	10,804	-47.1		28	10,733	-48.7		25	10,316	-54.2	
00----	24	11,859	-56.2		26	11,946	-58.6		21	12,199	-55.9		26	11,698	-57.0		27	12,247	-56.3		23	12,174	-56.8		25	11,730	-57 5	
75----	24	12,707	-56.2		24	12,785	-59 6		17	13,047	-60.0		26	12,541	-58.0		27	13,083	-61.4		21	13,010	-60 7		25	12,573	-57.0	
50----	24	13,684	-57.2		23	13,741	-60.9		14	13,999	-65.1		26	13,512	-57.7		26	14,026	-66 3		21	13,959	-64.8		25	13,549	-57 1	
25----	23	14,834	-59.8		23	14,869	-62.7		13	15,100	-69.6		26	14,658	-59.1		20	15,103	-72.1		21	15,061	-69 0		22	14,698	-58.5	
00----	22	16,221	-62.0		23	16,233	-65.9		6	16,423	-75.3		24	16,055	-61.5		11	16,372	-77.4		21	16,379	-73.5		21	16,087	-60 0	
)-----	19	17,590	-65.3		20	17,575	-66.7						21	17,430	-62.2		9	17,648	-77.7		20	17,672	-74.1		19	17,483	-60.9	
)-----	16	19,347	-62.9		11	19,298	-64.3						12	19,200	-60.7						17	19,369	-68 5		13	19,266	-60.1	
)-----	13	20,467	-62.0		8	20,387	-61.1						8	20,362	-60.6						15	20,475	-64.1		7	20,421	-59 2	
)-----	6	21,879	-58.3																		7	21,842	-58.8		[illegible]	21,803	-57.3	

	NASHVILLE, TENN. (1001 MB.)				NORTH PLATTE, NEBR. (917 MB.)				OAKLAND, CALIF. (1018 MB.)				OKLAHOMA CITY, OKLA. (972 MB.)				OMAHA, NEBR (983 MB.)				PHOENIX, ARIZ (976 MB)				PITTSBURGH, PA (976 MB)			
RFACE	28	177	4.8	77	28	849	- 2.1	75	28	6	10.8	72	28	391	4.2	72	28	308	- 2.5	79	28	338	13.0	53	28	382	0 0	77
000--	28	181			28	148			28	158	10.8	70	28	158			28	169			28	131			28	186		
0----	28	601	6.1	62	28	564			28	587	8.9	67	28	581	5 7	65	28	584	- 1.7	66	28	570	15.3	36	28	602	0 3	73
0----	28	1,042	4.4	57	28	997	0.8	60	28	1,030	6.5	62	28	1,021	5.4	59	28	1,008	- 1 0	55	28	1,023	12.3	35	28	1,031	- 1 6	70
0----	28	1,507	3.1	53	28	1,458	1.7	50	28	1,497	4.1	58	28	1,488	5.4	51	28	1,465	- 0.4	54	28	1,499	8.9	39	28	1,485	- 2 8	65
0----	28	1,996	1.1	47	28	1,945	0.0	49	28	1,988	1.5	54	28	1,982	3.8	48	28	1,949	- 1.9	54	28	1,997	5 4	42	28	1,965	- 3 7	55
0----	28	2,524	- 0.4	46	28	2,465	- 2.7	49	28	2,511	- 1.3	47	28	2,511	1.7	45	28	2,470	- 3 4	50	28	2,527	2.1	42	28	2,477	- 5.3	51
0----	28	3,063	- 2.5	45	28	3,004	- 5.7	46	28	3,052	- 4.1	42	28	3,057	- 0.9	39	28	3,004	- 6 2	48	28	3,075	- 1 0	40	28	3,013	- 7.3	47
0----	27	3,657	- 5.8	43	28	3,587	- 9.2	47	28	3,638	- 7.7	42	28	3,652	- 3.8	39	28	3,587	- 9 6	48	28	3,669	- 4.2	32	28	3,594	- 9 9	43
0----	27	4,275	- 9.2	38	28	4,195	-13.0	47	28	4,251	-11.5	41	28	4,273	- 7.8	40	28	4,195	-12.7	48	28	4,289	- 7 9		28	4,201	-13.4	41
0----	27	4,947	-13.1		28	4,855	-17.6	41	28	4,913	-15.8	45	28	4,950	-12.2	38	28	4,860	-17.3	50	28	4,966	-12.1		28	4,863	-16 7	40
0----	27	5,663	-17.9		28	5,558	-22.7		28	5,624	-20.9	45	28	5,666	-17.2	41	28	5,560	-22.0	50	28	5,682	-17.0	29	28	5,569	-21.2	41
0----	27	6,447	-23.6		28	6,328	-28.0		28	6,400	-26.3	42	28	6,448	-22.5	39	28	6,333	-27 4	48	28	6,466	-22.7	31	27	6,345	-26 9	42
0----	27	7,293	-29.6	37	28	7,159	-33.9	43	28	7,237	-32.4		28	7,302	-28 4	39	28	7,165	-33.3	46	28	7,316	-29 0		27	7,183	-33.4	43
0----	27	8,231	-36 8		28	8,081	-40.6		28	8,166	-38.5		28	8,244	-35.7		27	8,086	-40.4		28	8,256	-36 1		27	8,107	-40 1	
0----	27	9,280	-44.9		28	9.113	-48.3		28	9,209	-45.2		28	9,298	-43.8		26	9,136	-48.0		28	9,308	-43.8		27	9,142	-47.3	
0----	25	10,489	-53.0		28	10,292	-55.7		28	10,407	-51.8		26	10,499	-52.4		25	10,313	-55.6		25	10,518	-52.1		26	10,344	-54.9	
0----	25	11,908	-57.7		24	11,691	-58 8		26	11,831	-56.9		23	11,914	-58.3		24	11,720	-58.7		24	11,946	-57 5		25	11,759	-57 7	
5----	25	12,748	-58.4		21	12,515	-57.5		26	12,674	-57.2		22	12,750	-59.3		23	12,573	-56.8		23	12,792	-58.7		25	12,602	-57 4	
0----	23	13,721	-60.1		19	13,488	-58.4		23	13,633	-58.3		21	13,715	-60.8		21	13,556	-57.0		22	13,761	-60.1		25	13,574	-58.0	
5----	22	14,847	-61.8		18	14,632	-59.7		23	14,776	-60.0		19	14,851	-62.4		20	14,704	-59.2		21	14,894	-64 0		21	14,736	-59.1	
)----	20	16,208	-65.1		17	16,023	-61.1		23	16,156	-62.7		19	16,218	-65.3		18	16,085	-61.5		21	16,248	-66.9		21	16,128	-60 6	
-----	14	17,558	-67.1		15	17,421	-62.1		19	17,516	-62.1		17	17,575	-66.3		17	17,477	-62.9		16	17,585	-69 5		20	17,516	-62.2	
-----	9	19,302	-65.4		12	19,195	-61.8		12	19,284	-60.4		[illegible]	19,343	-66.1		10	19,264	-62.0		11	19,302	-66.8		13	19,316	-61 7	
-----	7	20,449	-64.1		[illegible]	20,366	-61.7		5	20,412	-58.7		7	20,467	-64.7		6	20,387	-60.3		9	20,410	-64 6		10	20,473	-60.4	
-----					5	21,752	-60.0														5	21,775	-60.8		8	21,878	-58.3	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

FEBRUARY 1

	PORTLAND, MAINE (1018 MB.)				RAPID CITY, S DAK. (904 MB)				ST. CLOUD, MINN. (982 MB.)				SAN ANTONIO, TEX. (991 MB)				SAN JUAN, P R (1015 MB.)				SANTA MARIA, CALIF (1010 MB)				S STE MARIE, MIC (993 MB)		
Standard pressure surface (mb)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature
SURFACE	27	20	-3.3	77	28	966	-3.4	59	28	317	-10.0	79	28	240	11.6	71	28	19	22.9	76	28	71	9.5	82	28	221	-7.8
1,000--	27	157	-2.2	73	28	150	.		28	171	-		28	162			28	150	22.2	72	28	157	10.2	76	28	166	
950----	27	572	-2.5	67	28	565			28	574	-8.4	75	28	597	11.5	67	28	595	18.5	76	28	589	10.2	60	28	573	-8.0
900----	27	993	-3.6	66	28	997			28	989	-6.2	68	28	1,043	10.0	64	28	1,055	14.8	80	28	1,032	8.3	52	28	985	-8.6
850----	27	1,444	-3.9	63	28	1,453	-0.2	46	28	1,438	-5.0	61	28	1,518	9.3	61	28	1,536	11.6	79	28	1,502	5.9	49	27	1,429	-8.4
800----	27	1,922	-4.3	62	28	1,937	-1.5	44	28	1,914	-6.1	58	28	2,020	8.3	47	28	2,043	11.4	48	28	1,997	3.6	47	28	1,897	-9.2
750----	27	2,433	-6.1	58	28	2,455	-4.2	44	28	2,424	-8.1	56	28	2,562	6.8	33	28	2,593	9.9		28	2,524	1.0	41	28	2,401	-10.8
700----	27	2,967	-8.6	52	28	2,988	-7.6	46	28	2,951	-10.4	54	28	3,116	4.9	26	28	3,150	7.3		28	3,070	-1.8	36	28	2,923	-12.7
650----	27	3,547	-11.3	50	28	3,570	-11.3	47	28	3,526	-13.2	50	28	3,721	1.6		28	3,764	3.8		28	3,661	-5.2		28	3,494	-15.5
600----	27	4,148	-14.7	51	28	4,170	-14.9	44	27	4,125	-16.5	48	28	4,356	-2.7		28	4,401	0.2		28	4,281	-9.0	31	28	4,086	-18.6
550----	25	4,817	-18.1	51	28	4,831	-19.2	40	27	4,776	-20.3	44	28	5,036	-7.5		27	5,096	-4.1		28	4,951	-13.6	34	28	4,734	-22.4
500----	24	5,512	-22.7	50	28	5,526	-24.1	40	27	5,473	-24.9	41	28	5,774	-12.8		27	5,837	-8.8		28	5,667	-18.7	34	28	5,424	-26.9
450----	24	6,281	-28.4		28	6,286	-29.4	38	27	6,230	-30.5	44	28	6,566	-19.0		26	6,657	-14.0		28	6,446	-24.3	36	28	6,180	-31.9
400----	24	7,110	-34.6		28	7,117	-35.5	39	27	7,057	-36.6		27	7,433	-25.7		26	7,530	-20.0		28	7,292	-30.7		27	7,015	-37.4
350----	24	8,030	-41.2		28	8,032	-42.1		27	7,970	-43.2		27	8,385	-33.0		26	8,507	-27.0		28	8,227	-37.3		25	7,931	-43.6
300----	24	9,060	-48.4		28	9,059	-49.6		27	8,992	-50.3		26	9,448	-40.9		26	9,599	-35.1		27	9,274	-44.3		25	8,950	-50.8
250----	24	10,241	-54.6		27	10,229	-56.4		26	10,169	-56.3		25	10,665	-49.3		26	10,847	-44.1		27	10,476	-51.9		24	10,130	-56.6
200----	20	11,654	-57.4		25	11,627	-58.3		26	11,578	-56.9		24	12,112	-56.7		26	12,306	-55.5		27	11,901	-57.3		21	11,555	-57.0
175----	20	12,499	-56.6		21	12,453	-56.4		24	12,417	-55.5		23	12,959	-58.9		26	13,146	-60.7		27	12,741	-58.9		18	12,412	-56.3
150----	18	13,496	-56.1		19	13,435	-55.8		23	13,395	-55.7		23	13,918	-61.7		25	14,093	-66.4		26	13,705	-59.3		16	13,407	-56.6
125----	17	14,659	-57.3		17	14,586	-57.7		23	14,553	-56.6		21	15,044	-65.1		23	15,179	-72.1		26	14,840	-61.9		15	14,555	-57.3
100----	15	16,062	-59.6		16	15,979	-59.0		22	15,956	-57.7		19	16,384	-68.7		21	16,484	-76.4		25	16,219	-65.0		12	15,985	-58.5
80-----	11	17,458	-60.2		13	17,409	-60.1		16	17,355	-58.0		16	17,696	-71.2		17	17,762	-77.6		24	17,573	-65.7		7	17,365	-60.4
60-----	6	19,249	-58.6						6	19,285	-59.0		11	19,408	-67.5		15	19,415	-72.0		20	19,316	-63.2				
50-----													5	20,511	-64.5		12	20,511	-67.2		13	20,455	-62.3				
40-----																	9	21,869	-63.4		7	21,868	-59.5				

	SPOKANE, WASH. (931 MB.)				SWAN ISLAND, W I. (1016 MB.)				TACUBAYA, N.MEX. (774 MB.)				TAMPA, FLA. (1022 MB.)				TATOOSH ISLAND,WASH. (1011 MB.)				TOLEDO, OHIO (999 MB.)				WASHINGTON, D. C. (1013 MB.)		
SURFACE	28	722	0.1	76	28	10	23.5	76	26	2,306	15.6	31	28	9	14.3	76	28	31	5.2	28	27	191	-2.7	78	28	88	2.0
1,000--	28	146			28	148	22.9	77	26	62			28	195	15.4	67	28	118	5.0	80	27	180			28	189	1.8
950----	28	565			28	598	19.3	82	26	523			28	631	13.6	60	28	539	3.3	74	27	591	-3.1	73	28	605	1.2
900----	28	996	0.2	66	28	1,057	15.8	84	26	997			28	1,083	11.4	58	28	973	0.6	73	27	1,015	-3.2	64	28	1,038	0.6
850----	28	1,452	-2.2	62	28	1,540	13.0	78	26	1,493			28	1,559	9.3	56	28	1,429	-1.9	67	27	1,467	-3.5	56	28	1,496	-0.6
800----	28	1,931	-4.9	61	28	2,049	11.4	58	26	2,020			28	2.060	8.1	39	28	1,909	-4.3	62	27	1,946	-4.4	50	28	1,979	-1.8
750----	28	2,445	-7.3	58	28	2,595	10.0		26	2,570	14.5	30	28	2,598	6.6	30	28	2,422	-7.1	61	27	2,460	-6.0	48	28	2,498	-3.3
700----	28	2,971	-10.4	55	28	3,157	7.4		26	3,146	10.6	32	28	3,155	4.0	27	28	2,951	-10.0	54	27	2,990	-8.4	47	28	3,034	-5.8
650----	28	3,545	-13.5	50	28	3,771	5.0		26	3,761	5.7	36	28	3,760	0.8		28	3,526	-13.0	52	27	3,571	-11.1	46	28	3,618	-8.4
600----	26	4,134	-17.6	47	27	4,411	1.1		26	4,407	.3	10	28	4,392	-3.0		28	4,124	-16.7	52	27	4,174	-14.5	46	28	4,229	-11.7
550----	26	4,784	-21.8	44	27	5,105	-3.3		25	5,100	-5.2	35	27	5,079	-7.5		28	4,777	-21.1	47	27	4,833	-18.5	46	28	4,895	-15.4
500----	26	5,475	-26.6		27	5,851	-8.4		25	5,840	-10.2		27	5,814	-12.7		28	5,469	-26.1	45	27	5,534	-22.9	45	28	5,605	-20.0
450----	26	6,232	-31.5		27	6,663	-13.7		24	6,647	-16.0		27	6,614	-18.6		28	6,226	-31.2	45	26	6,308	-27.8	47	28	6,381	-25.7
400----	25	7,043	-37.3		25	7,544	-19.6		22	7,519	-22.4		26	7,475	-25.3		28	7,048	-37.2	47	25	7,135	-33.7		28	7,219	-32.1
350----	24	7,957	-43.2		25	8,522	-26.5		22	8,487	-29.4		26	8,429	-32.9		28	7,959	-42.8		24	8,065	-40.0		28	8,147	-39.4
300----	23	8,979	-49.6		25	9,616	-34.8		21	9,575	-37.1		26	9,495	-40.9		28	8,984	-49.2		24	9,100	-47.7		28	9,184	-47.0
250----	23	10,156	-54.9		25	10,863	-44.9		19	10,814	-46.0		26	10,710	-49.8		28	10,164	-54.7		23	10,281	-55.1		27	10,362	-54.7
200----	23	11,569	-58.0		25	12,317	-55.8		17	12,267	-55.6		25	12,140	-57.5		26	11,587	-57.9		22	11,695	-58.6		27	11,772	-58.0
175----	22	12,412	-56.6		25	13,156	-60.6		17	13,108	-60.6		25	12,980	-59.4		24	12,420	-57.9		22	12,535	-57.7		26	12,617	-56.9
150----	20	13,381	-55.2		24	14,102	-66.2		14	14,058	-65.7		25	13,935	-62.8		23	13,396	-56.8		20	13,532	-57.7		26	13,590	-57.9
125----	19	14,543	-55.9		24	15,190	-72.0		11	15,166	-70.7		25	15,047	-66.7		22	14,542	-57.2		19	14,685	-59.0		25	14,736	-59.6
100----	18	15,959	-57.9		23	16,489	-77.4						25	16,379	-71.2		21	15,945	-58.7		19	16,076	-61.5		23	16,119	-62.3
80-----	14	17,365	-57.1		19	17,766	-79.8						24	17,690	-72.9		18	17,337	-59.0		15	17,457	-61.7		22	17,496	-63.0
60-----	13	19,175	-58.1		17	19,412	-73.9						19	19,396	-69.6		11	19,132	-58.9		11	19,245	-61.2		18	19,262	-61.4
50-----	6	20,366	-57.5		14	20,496	-68.8						16	20,495	-66.5		6	20,228	-60.3		8	20,364	-60.5		8	20,444	-59.1
40-----					12	21,852	-63.5						12	21,874	-62.9						6	21,755	-60.1				
30-----					9	23,626	-59.0																				

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200 G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21 FEBRUARY 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
urface	27	205	2.8	28	201	3.2	27	285	1.6	26	263	2.4	23	44	1.3	26	122	1.1	28	135	5.4	20	241	2.4	24	267	1.6	27	219	0.2	24	234	1.1	28	234	2.5
00	--	---	----	--	---	----	27	269	2.4	--	---	----	--	---	----	--	---	----	28	158	5.1	20	250	4.1	24	238	2.5	26	278	1.7	24	208	2.5	--	---	----
,000	27	218	3.9	--	---	----	24	290	3.5	--	---	----	23	271	4.1	26	131	1.5	20	181	5.2	14	260	6.8	20	258	2.8	24	285	4.6	20	226	5.5	--	---	----
,500	24	227	5.2	--	---	----	21	270	4.9	26	253	7.0	19	273	7.3	25	200	1.9	15	218	4.8	11	258	9.1	17	245	5.5	24	286	7.0	15	265	5.7	28	240	3.4
,000	23	245	7.8	28	216	3.7	19	270	8.7	25	266	8.8	17	275	8.3	22	224	4.0	15	231	4.6	11	272	7.6	11	248	5.7	23	289	9.2	14	281	8.1	28	255	4.1
,500	22	252	9.0	28	255	5.2	18	269	11.1	25	271	11.1	16	275	10.7	17	242	5.7	13	260	4.8	10	282	7.9	10	258	4.8	22	285	11.2	13	279	8.8	26	268	6.3
,000	21	266	11.1	28	274	7.1	18	275	12.4	25	278	13.4	15	284	11.6	16	252	6.8	13	277	6.2							21	279	12.0	12	284	10.5	26	265	7.8
,000	21	273	15.0	24	277	11.0	13	280	12.4	20	286	15.2	14	281	12.9	13	252	10.1	13	279	7.7							18	281	14.8	10	289	14.7	24	266	12.1
,000	20	275	17.8	23	275	14.7	10	275	15.5	12	292	15.0	11	280	17.4													18	282	17.9	10	290	19.4	23	259	13.7
,000	19	274	20.1	19	276	19.1																						15	277	19.6				22	261	15.6
,000	14	282	22.7	16	281	20.8																						11	288	21.8				18	263	22.6
0,000				12	286	20.3																												12	277	24.1

	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
urface	28	242	1.9	28	305	1.0	26	268	2.2	27	299	1.0	26	80	1.7	19	187	1.7	28	216	0.8	25	178	2.5	27	347	1.0	28	70	2.7	27	176	2.0	23	193	0.9
00	--	---	----	--	---	----	26	261	2.8	--	---	----	26	236	.3	19	194	3.1	--	---	----	24	213	4.3	27	345	1.0	27	75	4.1	25	177	1.7	23	189	3.1
,000	--	---	----	--	---	----	25	257	4.7	27	256	3.9	26	264	2.8	14	235	5.1	28	204	1.4	23	226	6.2	27	169	1.7	27	78	3.6	22	311	1.3	22	212	5.3
,500	--	---	----	28	298	.9	24	267	6.9	26	270	7.5	25	278	3.6	14	259	6.7	28	217	2.0	22	252	7.9	22	209	4.5	25	66	2.5	18	298	3.7	20	230	7.1
,000	28	238	1.8	28	249	.9	23	278	10.2	24	282	9.2	24	287	5.2	12	269	8.3	28	236	2.8	19	263	10.9	16	220	6.7	23	37	1.7	13	276	3.8	18	252	8.1
,500	28	225	2.0	26	229	2.9	22	279	13.4	23	283	10.7	24	280	6.6	12	279	9.5	28	242	2.9	19	267	11.8	12	224	6.6	22	342	2.2	10	286	7.5	16	273	9.3
,000	27	237	3.5	24	236	4.7	19	284	14.3	20	277	9.9	23	276	8.3	11	286	12.2	27	279	3.2	17	269	12.7	10	228	6.0	20	332	3.4				14	273	13.6
,000	22	273	6.1	20	264	7.7	17	285	15.8	19	281	10.7	21	284	12.1				26	278	7.3	12	276	16.4				18	317	5.4				10	284	16.4
,000	20	286	11.2	15	285	10.1	16	284	18.4	13	294	11.5	18	293	15.6				24	290	10.3	10	289	19.1				16	320	9.4						
,000	19	286	13.4	13	292	11.6	15	282	20.8	11	293	11.3	16	289	17.8				23	283	14.5							16	312	11.6						
,000	16	289	19.5	12	300	20.6	11	297	18.6				11	292	20.0				16	297	16.9							10	305	18.0						
0,000	12	298	20.5																																	

	New York, N.Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)		
urface	23	317	4.5	27	236	0.2	25	200	4.1	25	263	0.3	28	153	0.6	27	18	1.1	20	263	0.4	19	183	2.2	26	137	1.5	27	267	3.4	21	316	1.4	24	282	0.6
00	22	315	5.3	27	240	1.8	25	205	4.5	25	235	1.2	28	171	.4	--	---	----	20	281	.5	19	206	3.7	26	147	2.0	27	284	2.7	21	292	1.9	24	209	2.4
,000	22	312	6.1	23	262	1.6	24	215	7.6	21	219	3.1	28	188	1.0	27	15	1.0	19	278	3.3	17	237	7.0	23	171	2.8	24	312	1.5	16	276	2.3	19	202	2.6
,500	21	312	8.5	23	257	1.7	23	226	9.3	20	272	4.1	26	190	1.5	27	292	2.6	16	289	8.8	15	256	8.7	22	209	3.8	23	320	.7	14	266	5.5	15	212	2.4
,000	16	314	10.0	21	263	1.9	22	242	10.8	20	270	5.9	25	199	1.9	25	286	6.5	15	291	10.4	15	261	10.9	20	254	5.0	23	298	2.0	13	267	7.3	14	227	3.0
,500	12	307	10.5	19	265	2.7	22	250	11.5	19	284	7.8	24	228	2.1	24	286	8.8	14	297	10.7	14	266	12.0	19	265	7.4	19	325	4.3	13	273	9.5	12	246	3.0
,000				18	279	3.7	21	261	13.6	19	287	9.6	23	265	2.6	24	286	10.2	13	299	12.6	13	274	15.3	19	267	9.9	19	313	5.8	12	271	10.6	11	267	3.4
,000				15	308	5.8	20	266	16.7	19	287	12.6	18	281	7.6	18	284	10.2	13	297	15.8	12	275	20.4	18	273	13.6	17	301	6.9	12	270	13.5			
,000				13	324	10.8	19	273	20.0	11	291	15.7	17	294	10.8	17	283	11.6	12	291	19.0				15	280	16.6	17	287	9.8						
,000				11	317	18.0	15	285	22.1	10	285	18.5	12	284	12.3	13	276	11.3	12	291	24.4				12	281	20.8	17	281	12.2						
,000																												12	286	17.7						

	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
urface	25	183	1.7	23	296	2.2
00	--	---	----	23	298	3.8
,000	25	214	3.1	23	290	5.1
,500	24	228	5.2	22	295	8.0
,000	21	238	6.5	22	298	10.9
,500	18	246	7.9	21	297	12.8
,000	14	264	7.3	19	286	14.9
,000				15	294	20.1
,000				13	304	23.6

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

Altitude (meters) m s l	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	111	0.6	28	153	3.7	28	67	1.6	28	120	3.6	28	104	1.7	28	299	2.3
500	--	---	----	--	---	----	--	---	----	26	147	8.3	25	137	2.7	28	292	2.1
1,000	--	---	----	28	192	6.0	27	288	3.2	26	164	7.1	25	159	1.9	27	313	2.5
1,500	--	---	----	28	231	6.5	27	291	5.9	27	184	6.1	25	219	2.5	27	279	4.4
2,000	28	269	3.6	28	256	7.1	26	291	8.2	27	196	5.9	25	224	3.6	26	269	6.5
2,500	28	269	6.0	27	272	9.5	26	287	9.5	27	215	5.7	25	237	5.4	25	263	7.2
3,000	28	274	7.6	27	271	11.4	26	288	11.0	27	230	6.0	26	245	7.3	25	261	9.0
4,000	28	280	9.2	27	267	13.5	25	282	13.1	26	247	7.5	26	259	10.0	25	261	11.6
5,000	26	284	13.4	26	269	14.9	22	285	14.3	26	265	9.3	25	266	11.9	25	255	11.9
6,000	24	285	15.5	21	260	18.2	21	276	14.4	25	267	10.5	24	268	14.2	25	247	15.1
8,000	14	289	16.9	11	249	21.3	17	277	12.9	23	264	14.1	23	272	16.7	20	258	11.3
10,000	10	297	21.5				16	262	14.6	23	264	17.7	23	280	21.4	18	257	14.7
12,000							12	250	14.0	23	264	23.1	22	272	28.7	14	255	15.8
14,000							11	262	16.1	15	272	21.3	17	275	30.5			
16,000										12	264	16.5						
18,000										10	256	10.6						

Altitude (meters) m s l	Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			Internatio Falls, Min (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	278	1.0	28	159	1.1	28	77	0.8	28	337	1.4	27	322	3.0	26	270	0.
500	27	252	2.8	28	202	2.9	--	---	----	28	289	2.2	26	322	5.1	26	255	1.
1,000	27	266	4.5	28	219	4.4	--	---	----	28	256	4.4	24	319	4.9	26	250	2.
1,500	27	267	5.7	28	247	5.4	28	104	.7	28	269	5.7	25	298	6.8	25	277	4.
2,000	28	274	7.1	27	265	7.8	28	189	1.3	28	278	7.1	25	283	8.4	25	285	6.
2,500	28	276	8.7	27	267	9.4	28	223	3.7	27	277	9.1	25	279	10.2	25	291	8.
3,000	26	283	9.6	27	268	11.1	28	244	5.4	27	273	11.7	24	280	12.3	25	290	11.
4,000	24	268	13.3	26	269	13.0	28	266	6.6	26	281	15.3	23	277	13.0	24	288	14.
5,000	22	276	15.1	26	267	14.7	28	278	9.8	24	281	16.9	20	275	14.8	25	282	15.
6,000	21	277	15.8	26	273	18.6	28	281	12.0	21	280	17.0	20	279	15.6	23	274	16.
8,000	17	290	19.0	20	267	21.1	14	294	10.9	17	284	21.3	17	279	20.9	17	270	18.
10,000	14	287	30.6	18	270	26.1				16	293	26.7	15	287	21.8	13	265	16.
12,000				14	276	25.0				11	279	27.4	11	274	25.6	12	261	22.
14,000				10	277	28.5										11	269	24.
16,000																		
18,000																		

Altitude (meters) m s l	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	20	0.4	28	197	0.4	28	30	1.6	24	343	2.4	27	184	0.5	28	289	1.1
500	27	216	3.3	28	186	.7	28	74	5.0	24	324	4.7	27	204	4.2	28	289	2.5
1,000	27	236	5.8	28	188	2.0	28	80	5.4	23	316	4.5	27	224	5.9	28	271	2.7
1,500	27	252	7.3	28	214	4.6	28	84	3.3	22	287	5.1	27	241	7.9	28	269	3.5
2,000	26	262	7.1	28	227	6.5	28	111	1.0	21	286	7.1	25	251	9.0	28	271	4.4
2,500	25	263	9.3	28	236	8.2	28	255	1.1	22	282	7.8	25	257	10.4	28	276	5.6
3,000	24	269	11.8	28	247	10.5	28	298	2.5	21	274	8.9	24	269	13.3	28	268	7.3
4,000	22	266	15.3	26	260	10.2	28	303	5.7	19	275	10.4	23	270	16.3	27	278	8.9
5,000	21	267	17.8	25	272	12.0	28	301	7.3	19	277	15.2	22	269	18.4	25	273	12.7
6,000	21	273	21.9	21	283	9.8	27	297	9.3	16	268	19.3	19	278	18.5	22	264	13.9
8,000	14	279	24.4	13	268	9.7	27	292	15.6	10	267	19.0	18	283	22.9	15	287	15.3
10,000				12	286	13.6	26	284	21.6				12	291	24.4	12	290	21.2
12,000							21	285	28.4									
14,000							15	276	21.7									
16,000							14	288	19.6									
18,000																		

Altitude (meters) m s l	Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Mari Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	27	127	2.6	28	19	1.5	28	115	2.2	28	75	3.5	28	90	0.2	28	264	0.
500	24	144	2.0	--	---	----	28	127	4.1	27	58	6.2	28	183	.6	28	334	2.
1,000	24	217	3.6	28	11	1.5	28	169	5.2	27	56	5.4	28	253	3.2	28	334	2.
1,500	24	238	4.7	28	297	3.5	28	198	5.9	27	41	4.5	27	267	6.1	28	333	2.
2,000	24	253	5.9	28	301	5.9	28	226	6.7	27	34	3.9	27	275	7.5	28	300	2.
2,500	26	253	7.8	28	297	7.1	28	243	8.2	27	15	2.5	26	276	8.6	28	286	4.
3,000	25	266	9.4	28	291	8.9	27	256	10.1	28	341	2.5	27	281	9.7	28	283	5.
4,000	25	263	13.5	28	286	11.2	27	261	12.4	28	303	4.5	25	288	13.2	26	286	9.
5,000	25	262	15.8	28	286	13.2	26	258	14.6	27	303	6.2	24	284	14.1	25	273	10.
6,000	25	265	18.9	26	280	13.9	24	258	15.6	27	292	9.1	24	282	15.4	25	280	14.
8,000	19	270	23.3	23	277	17.1	13	265	17.4	26	289	18.7	20	273	17.6	22	277	18.
10,000	10	270	27.2	19	278	16.8				26	275	26.7	17	259	21.9	16	276	16.
12,000				11	274	17.0				26	270	30.3	15	264	22.9	15	284	17.
14,000										25	276	24.1	12	260	19.9	14	278	19.
16,000										19	288	15.0	10	258	19.9	12	276	14.
18,000										15	296	10.2				12	275	12.

Altitude (meters) m s l	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	3	0.8	27	192	1.2	27	127	3.2
500	28	235	1.3	--	---	----	27	176	3.9
1,000	28	272	4.1	27	198	2.6	27	204	5.0
1,500	27	279	6.1	27	219	4.7	27	210	5.6
2,000	26	280	6.3	27	241	6.8	26	224	6.1
2,500	26	279	7.2	25	247	4.9	24	248	5.5
3,000	26	274	8.6	24	260	8.3	24	258	6.3
4,000	25	268	12.1	23	266	9.6	24	263	7.2
5,000	25	273	15.3	23	263	11.7	23	286	7.1
6,000	21	268	15.4	19	268	10.1	23	284	7.5
8,000	14	268	15.9	12	336	5.6	17	279	10.7
10,000				11	340	11.0	16	284	14.8
12,000							12	293	15.6
14,000							12	289	12.3
16,000							11	293	9.1
18,000							10	268	7.6

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL D National Summary.

SOLAR RADIATION DATA

Table 30.—Solar radiation intensities, tabulated in langleys per minute. FEBRUARY 1951

TABLE MOUNTAIN, CALIF.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a. m.	1:30 p. m.
	Air mass 3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
February										Mb.	Mb.
1-----	----	----	----	1.56	----	----	----	----	----		
3-----	----	----	----	1.49	----	----	----	----	----		
6-----	----	----	----	1.48	----	----	----	----	----		
9-----	1.16	1.26	1.36	1.49	----	----	----	----	----		
13----	----	----	----	1.54	----	----	----	----	----		
15----	----	----	----	1.49	----	----	----	----	----		
19----	----	----	----	1.53	----	----	----	----	----		
28----	----	----	----	1.49	----	----	----	----	----		
Averages	1.16	1.26	1.36	1.51	----	----	----	----	----		
Departures	-.03	-.02	-.02	.00	----	----	----	----	----		

LINCOLN, NEBR.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a. m.	1:30 p. m.
	Air mass 4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
February										Mb.	Mb.
1-----	0.89	1.02	1.22	1.40	----	----	----	----	----	0.6	1.6
20----	----	----	----	----	----	1.09	0.94	0.79	0.66	5.8	5.6
26----	.74	.83	.99	1.20	1.38	1.22	1.07	.96	.83	6.1	7.5
Averages	.82	.93	1.11	1.30	1.38	1.16	1.01	.88	.80	---	---
Departures	-.08	-.07	-.04	-.04	-.10	-.17	-.19	-.12	-.10	---	---

MADISON, WIS.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a. m.	1:30 p. m.
	Air mass 4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
February										Mb.	Mb.
2-----	0.88	0.95	1.07	1.33	----	----	----	----	----	0.3	0.9
5-----	Foggy		.54	.95	----	----	----	----	----	1.1	3.0
7-----	.92	1.04	1.21	1.28	----	----	----	----	----	0.7	0.7
9-----	.92	1.04	1.16	1.25	----	----	----	----	----	0.4	0.9
14----	.91	1.06	1.18	1.35	----	----	----	----	----	0.5	1.4
Averages	.91	1.02	1.03	1.23	----	----	----	----	----	---	---
Departures	+.05	+.02	-.11	-.09	----	----	----	----	----	---	---

BOSTON, MASS.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a. m.	1:30 p. m.
	Air mass 4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
February										Mb.	Mb.
8-----	0.72	0.84	0.94	----	----	----	----	----	----	1.4	0.9
9-----	1.05	1.15	1.30	1.46	----	1.48	----	----	----	0.8	0.9
16----	.64	.74	.62	.96	----	1.13	0.92	0.79	0.72	2.6	3.6
23----	.88	.94	1.13	----	----	----	----	----	----	3.5	3.0
Averages	.82	.92	1.00	1.21	----	1.31	.92	.79	.72	---	---
Departures	+.11	+.08	+.06	+.07	----	+.10	-.13	-.04	+.03	---	---

*Extrapolated

TACUBAYA, D. D. MEXICO

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a m	1:30 p m
	Air mass 3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
February										Mb.	Mb.
1----	0.62	0.79	0.80	0.98	----	0.88	0.62	0.37	0.38	5.9	5.7
2----	.83	1.01	1.06	.76	----	1.31	1.07	----	.68	7.1	5.2
3----	.54	.53	.56	.80	----	1.12	.91	----	.61	4.5	4.7
6----	----	.23	.22	.65	----	.96	.87	.41	.33	6.3	6.8
7----	----	.76	.88	1.13	----	.91	.45	.17	.15	6.3	5.6
8----	----	----	.65	.65	----	.94	.56	----	.31	6.3	5.3
9----	----	.64	.60	.75	----	1.10	.73	.52	.42	4.8	3.7
10---	----	----	.95	1.23	----	1.01	.67	.49	.37	4.3	4.1
12---	.58	.70	.69	----	----	----	----	----	----	5.9	6.1
13---	----	.41	----	----	----	----	----	----	----	6.5	6.7
14---	.49	.62	.64	----	----	1.09	.77	.65	----	7.1	6.5
15---	----	.58	.72	----	----	----	.90	.82	----	7.1	8.9
16---	----	.49	.59	.75	----	.78	----	----	----	7.3	6.5
17---	----	----	.59	1.07	----	----	----	----	----	8.1	7.7
19---	----	.78	.87	.71	----	1.11	.95	----	.69	6.9	6.0
20---	----	.72	.61	.86	----	.69	.37	----	.17	6.0	6.8
22---	----	.45	.57	.88	----	----	----	----	----	7.1	6.9
23---	----	----	.48	.59	----	----	----	----	----	6.3	6.7
24---	----	----	.62	.72	----	.97	----	.27	.11	6.9	6.9
26---	----	----	.54	.45	----	.92	.54	.36	.22	6.5	8.4
27---	----	----	.77	1.04	----	.77	.24	.16	----	7.3	6.8
28---	----	.32	.53	.88	----	.83	.45	.35	.24	6.4	5.7
Averages	.61	.60	.66	.83	----	.96	.67	.42	.36	---	---
Departures	----	----	----	----	----	----	----	----	----	---	---

BLUE HILL, MASS.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a m	1:30 p m
	Air mass 4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
February										Mb.	Mb.
4----	----	----	----	----	----	----	----	1.17	0.98	2.7	3.5
5----	----	----	----	----	----	----	1.05	.94	.82	3.2	1.7
6----	0.55	0.66	0.81	----	----	----	----	----	----	2.8	4.1
9----	1.06	1.18	1.30	1.48	----	1.45	1.31	1.18	1.06	0.8	0.8
11---	----	----	----	----	----	----	1.08	.98	.88	2.6	3.9
16---	.95	1.06	1.17	1.32	----	1.28	1.14	.98	.88	2.1	3.0
23---	.88	.99	1.10	1.24	----	----	----	----	----	3.2	2.8
25---	----	----	----	----	----	1.36	1.25	1.09	.98	1.9	2.4
26---	.76	.89	1.04	----	----	----	----	----	----	4.8	5.6
Averages	.84	.96	1.08	1.35	----	1.36	1.17	1.06	.93	---	---
Departures	-.07	-.06	-.03	+.05	----	+.07	+.03	+.06	+.03	---	---
	RATIO BOSTON/BLUE HILL ON COMPARABLE DATES										
	0.85	0.85	0.84	0.86	----	0.96	0.81	0.81	0.82		

ALBUQUERQUE, N.M.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a m	1:30 p m
	Air mass 4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
February	NO RECORD BEFORE THE 14TH BECAUSE RECORDER INOPERATIVE									Mb.	Mb.
14---	0.97	1.08	----	----	----	1.38	1.25	1.16	1.06	1.2	1.1
15---	.94	1.09	1.26	1.48	----	----	1.41	----	----	1.3	2.0
16---	----	----	----	----	----	----	1.31	1.11	.93	2.0	1.7
17---	----	.96	1.14	1.32	----	----	----	----	----	2.7	4.0
18---	.90	1.04	1.16	1.35	----	----	----	----	----	3.6	2.3
19---					CLOUDY						
20---	1.00	1.16	1.33	1.48	----	1.58	1.43	1.28	1.22	2.7	2.4
Averages	.95	1.07	1.22	1.41	----	1.48	1.35	1.18	1.07	---	---
Departures	-.05	-.03	+.02	+.07	----	+.15	+.12	+.06	.00	---	---
	NO RECORD AFTER 20TH BECAUSE OF EQUATORIAL MOUNTING FAILURE										

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	29	30	31	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	37	249	82	54	303	65	586	197	451	437	123	337	622	497	217	384	122	316	14	457	558	330	22	260
Date	19	20	21	22	23	24	25	Average																
Langleys	181	41	47	42	287	108	462	167																

Table 31b .-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	29	30	31	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	21	46	54	38	59	43	88	50	87	76	56	70	55	53	79	68	63	51	9	65	53	56	17	45
Date	19	20	21	22	23	24	25	Average																
Langleys	45	40	33	29	75	77	67	52																

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	29	30	31	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	44	123	103	59	141	106	79	93	101	99	111	146	52	85	148	106	142	109	18	120	60	--	34	81
Date	19	20	21	22	23	24	25	Average																
Langleys	86	87	69	65	148	141	92	98																

Note.—Langley is the unit used to denote one gram calorie per square centimeter

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. FEBRUARY 1951

1951	Aklavik, MacKenzie	Albany, N.Y.	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Is., Pac. Area	Charleston, S.C.	Cleveland, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.
January 29---	35		201		361	147	49	269	51	62	672	367	170	61	136	35
January 30---	22		257		239	162	176	266	179	91	723	222	300	325	220	221
January 31---	14		280		400	55	119	279	90	85	699	93	32	221	71	86
February 1---	11		402		117	132	64	113	53	480	733	193	89	302	94	54
February 2---	15		416		317	331	(265)	61	(187)	465	723	321	318	115	254	182
February 3---	16		406		458	354	117	106	(93)	522	674	421	343	123	212	101
February 4---	13		277		452	419	(338)	52	(272)	504	710	437	279	94	136	192
Averages------	18		320		335	229	(161)	164	(132)	316	705	293	219	177	160	125
Departures----	-10		-17		-10	---	-49	+5	-38	---	---	---	---	-28	+6	-70
February 5---	17		294		449	398	289	159	232	353	728	427	100	244	98	248
February 6---	22		402		283	163	297	94	230	474	714	246	116	242	23	257
February 7---	64		393		449	442	149	117	108	498	646	339	116	212	157	112
February 8---	69		376		473	413	266	279	253	480	727	444	221	194	224	273
February 9---	73		419		441	88	371	158	329	477	718	229	295	197	261	339
February 10---	68		433		304	120	328	145	258	505	733	283	297	95	167	301
February 11---	32		342		421	271	195	114	115	531	721	443	247	146	179	232
Averages------	49		380		403	271	271	152	218	474	712	344	199	190	158	252
Departures----	+7		+10		+16	---	+49	-36	+41	---	---	---	---	-49	-8	+46
February 12---	28		432		460	428	168	359	127	522	720	446	15	366	20	211
February 13---	27		185		472	407	(247)	247	213	254	728	437	23	347	53	227
February 14---	49		464		446	352	20	250	11	97	703	388	137	229	292	19
February 15---	98		469		483	317	332	264	279	471	688	111	245	350	304	187
February 16---	77		454		140	51	381	337	303	295	586	131	133	377	51	358
February 17---	35		353		411	231	---	285	237	267	742	257	63	179	83	290
February 18---	38		430		447	362	(41)	243	20	460	758	414	225	382	182	54
Averages------	50		398		408	307	(198)	284	170	338	704	312	120	319	141	192
Departures----	-7		+17		-14	---	-35	+49	-12	---	---	---	---	+23	-50	-30
February 19---	74		254		401	---	(190)	337	132	284	763	442	124	366	16	178
February 20---	124		490		444	184	98	86	69	401	723	379	72	160	67	78
February 21---	48		461		523	187	77	150	55	544	782	292	18	279	42	114
February 22---	42		468		525	485	73	295	64	284	795	492	119	224	200	81
February 23---	52		293		462	452	292	221	227	346	738	482	164	389	213	308
February 24---	105		97		465	414	161	244	132	290	712	437	402	380	266	168
February 25---	115		367		457	379	383	194	337	483	643	(440)	160	280	90	---
Averages------	80		347		468	350	(182)	218	145	376	736	(423)	151	297	128	154
Departures----	-6		-21		+37	---	-82	-38	-70	---	---	---	---	-7	-65	-95
Accumulated Departures January 1 to February 25, 1951	-98		-35		+238	---	-819	-224	-161	---	---	---	---	-2191	-1337	-1148

1951	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Lake, Colo.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Inyokern, Calif.	Ithaca, N.Y.	Lake Charles, La.	Las Vegas, Nev.
January 29---	105	388	128	46		42	270	267	99	119	326	468	403	---	45	149
January 30---	116	346	352	20		160	331	244	220	131	43	507	399	---	30	342
January 31---	190	(324)	367	35		309	279	271	217	57	185	513	369	---	---	376
February 1---	116	419	360	54		342	177	129	364	80	274	337	238	---	373	370
February 2---	123	473	124	53		307	226	137	210	333	93	463	421	---	415	312
February 3---	113	464	136	78		356	---	206	148	422	27	465	378	---	443	322
February 4---	99	455	286	76		274	---	220	83	430	352	439	376	292	426	269
Averages------	123	(410)	251	52		256	257	211	191	225	186	456	370	---	289	306
Departures----	-4	-7	---	+14		+48	+8	+11	-22	---	---	-6	-8	---	+3	-8
February 5---	134	438	208	84		294	411	194	172	(418)	383	377	363	169	156	355
February 6---	236	464	372	67		172	---	277	237	172	364	547	439	226	134	366
February 7---	139	460	268	64		338	396	157	164	456	34	536	329	26	---	343
February 8---	152	471	295	78		120	442	220	243	450	436	557	462	245	451	222
February 9---	145	468	372	98		292	398	195	331	113	140	554	453	374	209	386
February 10---	142	479	334	33		314	329	212	379	113	121	565	469	318	(103)	396
February 11---	240	461	262	26		304	---	179	332	221	426	448	483	127	334	225
Averages------	170	463	302	64		262	395	205	266	(278)	272	512	428	212	(232)	327
Departures----	+4	+27	---	+7		+2	+66	-28	-7	---	---	+36	+1	+9	-31	-6
February 12---	202	(456)	249	31		251	429	287	105	432	---	429	493	61	440	218
February 13---	219	55	418	39		402	414	318	415	367	---	558	492	52	364	424
February 14---	144	402	392	(37)		261	---	302	422	408	---	490	508	112	108	406
February 15---	207	532	319	84		371	358	302	417	352	---	480	510	365	110	410
February 16---	255	465	427	104		402	310	324	416	48	---	450	399	354	465	362
February 17---	179	423	414	65		365	362	321	438	252	---	460	438	57	264	427
February 18---	184	530	238	38		444	369	306	371	407	---	107	528	120	337	350
Averages------	199	(409)	351	(57)		357	374	309	369	324	---	425	481	160	299	371
Departures----	-1	-27	---	-16		+54	+24	+34	+26	---	---	+5	+19	-49	-15	-1
February 19---	226	(477)	477	162		429	440	334	284	411	---	84	527	114	312	457
February 20---	269	524	(349)	58		430	425	325	403	207	---	98	548	61	391	455
February 21---	218	510	381	55		306	434	210	452	247	---	214	539	47	512	444
February 22---	286	508	236	36		441	489	190	292	478	---	498	330	154	458	344
February 23---	265	269	253	75		308	449	332	383	457	---	514	559	348	(485)	420
February 24---	222	490	444	142		451	---	293	362	413	---	368	553	425	481	428
February 25---	128	467	300	127		433	---	254	403	397	---	445	153	182	346	382
Averages------	231	464	349	94		401	447	277	369	373	---	317	459	190	(427)	419
Departures----	+8	+2	---	+1		+116	+69	-31	+9	---	---	-86	+21	-52	+74	+14
Accumulated Departures January 1 to February 25, 1951	-28	-112	---	+49		+1155	+1169	---	-49	---	---	-371	+112	-1253	+343	00

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.(Cont'd.) FEBRUARY 1951

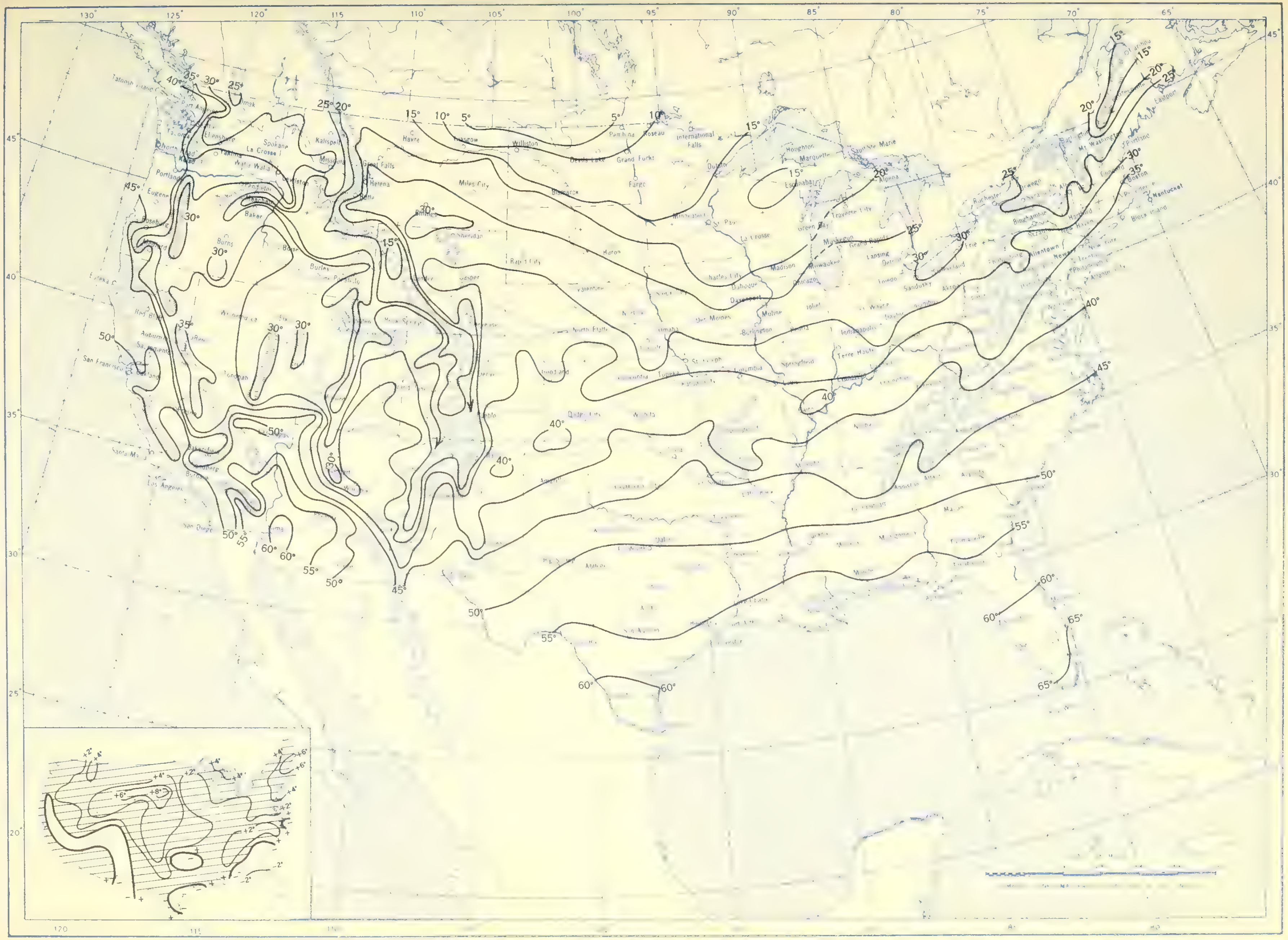
1951	Lincoln, Nebr.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T.H.	Phoenix, Ariz.	Portland, Me.	Put-in-Bay, Ohio
January 29---	210	237	205	298	22	41	44	243	35	247	436			
January 30---	173	235	245	300	81	177	137	225	91	292	469			
January 31---	183	116	129	115	5	73	49	99	15	174	509			
February 1---	351	252	223	107	---	51	19	34	62	78	428			
February 2---	346	309	307	74	---	209	233	143	368	303	484			
February 3---	321	275	174	61	---	90	68	65	388	254	465			
February 4---	250	141	170	68	302	293	258	139	187	210	451			
Averages------	262	224	208	146	102	133	115	135	164	223	463			
Departures----	+45	+34	+18	-6	-66	-72	-56	+16	-24	+7	-3			
February 5---	152	129	258	158	212	278	247	208	375	223	372			
February 6---	295	191	82	132	105	276	224	40	111	259	531			
February 7---	288	13	347	172	348	96	31	72	352	81	491			
February 8---	191	289	184	214	250	311	240	63	307	326	537			
February 9---	228	273	322	308	57	349	316	30	77	364	550			
February 10---	331	244	199	199	192	263	291	36	109	338	539			
February 11---	326	---	249	110	101	299	225	129	289	56	498			
Averages------	259	190	234	185	181	267	225	82	231	231	503			
Departures----	+10	00	+29	-5	-4	+49	+50	-47	+15	+7	+28			
February 12---	84	177	65	286	224	202	142	162	237	112	510			
February 13---	252	68	222	270	291	249	193	256	368	86	532			
February 14---	287	73	352	177	---	15	48	136	324	343	529			
February 15---	76	75	310	160	---	316	256	271	232	363	409			
February 16---	171	239	29	329	---	374	286	298	18	389	463			
February 17---	360	155	136	146	416	229	56	147	309	87	452			
February 18---	220	315	212	325	283	95	275	256	171	101	120			
Averages------	207	157	189	242	303	211	179	218	237	212	431			
Departures----	-49	-13	-37	+15	+74	-29	-18	---	-5	-15	+6			
February 19---	51	326	89	207	302	122	121	60	100	248	170			
February 20---	187	178	81	157	167	82	51	217	140	50	167			
February 21---	347	112	137	217	86	87	29	288	58	116	251			
February 22---	294	63	158	230	421	171	347	348	372	240	421			
February 23---	271	294	92	351	383	369	407	338	430	411	441			
February 24---	122	211	251	213	407	135	367	135	411	418	461			
February 25---	9	36	151	286	355	373	356	205	322	298	418			
Averages------	183	174	137	237	303	191	240	227	262	254	333			
Departures----	-93	-51	-109	-19	+62	-68	+9	---	-25	-19	-69			
Accumulated Departures January 1 to February 25, 1951	-280	-273	-252	-175	+791	-1057	+280	---	-311	-210	-259			

1951	Raleigh, N.C.	Rapid City, S. Dak.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle (U. of W.), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Toronto, Ont.	Upton, N.Y.	Washington, D.C.	Winnipeg, Manitoba
January 29---	304	314	93	311	202	178		32	---	61	218	239	91	341	165	(39)	45	226
January 30---	36	---	164	249	257	383		153	---	70	242	268	226	222	246	160	75	219
January 31---	40	316	353	224	299	401		51	---	60	151	251	52	195	49	47	23	219
February 1---	139	321	363	323	227	409		52	34	136	26	107	17	382	37	50	40	221
February 2---	300	---	361	300	105	385		216	219	239	105	179	249	386	254	204	313	166
February 3---	256	269	342	192	192	407		82	147	85	72	222	268	294	184	74	---	148
February 4---	227	---	321	278	114	360		298	251	301	118	156	260	325	149	276	---	141
Averages------	186	305	285	268	199	360		126	163	136	133	203	166	306	155	(121)	99	191
Departures----	---	+54	+30	+30	-26	+6		-29	---	-36	---	+27	+12	---	+12	-24	-101	+14
February 5---	401	173	295	134	98	367		287	235	287	113	191	145	146	116	(267)	295	111
February 6---	341	262	348	285	191	407		294	218	297	54	138	185	291	112	265	261	202
February 7---	185	116	290	337	103	394		62	24	38	109	64	62	193	143	57	33	273
February 8---	416	211	279	247	272	316		228	268	315	54	144	261	116	311	214	374	267
February 9---	141	163	355	150	294	417		363	312	344	22	97	290	363	285	338	212	147
February 10---	392	237	317	211	276	363		270	318	264	59	145	303	358	219	248	276	111
February 11---	414	224	77	89	211	273		250	182	316	101	86	235	340	129	206	343	151
Averages------	327	198	280	208	206	362		251	222	265	73	123	212	258	188	(228)	256	180
Departures----	---	-57	-15	-22	-14	-5		+31	---	+34	---	-51	+39	---	+13	+26	+44	-20
February 12---	417	193	289	282	264	413		312	67	317	246	326	43	283	17	270	340	292
February 13---	407	367	400	370	346	442		216	63	301	211	297	70	17	51	214	306	280
February 14---	420	354	323	309	359	342		30	84	199	202	275	85	83	320	16	(218)	342
February 15---	136	363	394	380	302	167		370	330	176	170	80	346	167	188	368	118	284
February 16---	82	350	143	137	301	437		399	296	397	241	246	160	419	205	366	175	250
February 17---	196	312	398	96	381	417		66	(90)	55	40	261	41	217	21	57	103	57
February 18---	282	290	214	83	84	468		366	(85)	366	195	239	106	148	103	330	287	236
Averages------	277	318	309	237	291	384		251	145	259	186	246	121	190	129	231	(221)	249
Departures----	---	+43	-16	+31	+22	-7		+1	---	-7	---	+24	-53	---	-29	+7	-6	+45
February 19---	204	228	---	79	376	478		134	118	98	51	143	19	348	35	92	(74)	184
February 20---	255	334	---	210	362	465		100	37	126	166	342	240	81	70	97	69	129
February 21---	181	378	---	250	365	466		25	45	52	255	321	22	349	32	20	42	110
February 22---	471	101	---	163	292	381		361	195	408	306	351	351	417	234	295	419	237
February 23---	512	---	---	116	103	246		430	329	426	298	368	323	333	343	403	445	160
February 24---	526	225	---	74	375	507		267	291	449	57	187	416	178	364	147	449	95
February 25---	457	318	---	106	284	494		405	255	398	221	196	314	41	234	382	383	52
Averages------	372	264	---	143	308	434		246	181	280	193	273	241	250	187	205	(269)	138
Departures----	---	-41	---	-86	+21	+23		-28	---	-11	---	+14	+23	---	+1	-44	+5	-73
Accumulated Departures January 1 to February 25, 1951	---	-70	-623	-448	+63	+98		-140	---	-98	---	+28	+175	---	+210	-308	+308	-336

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

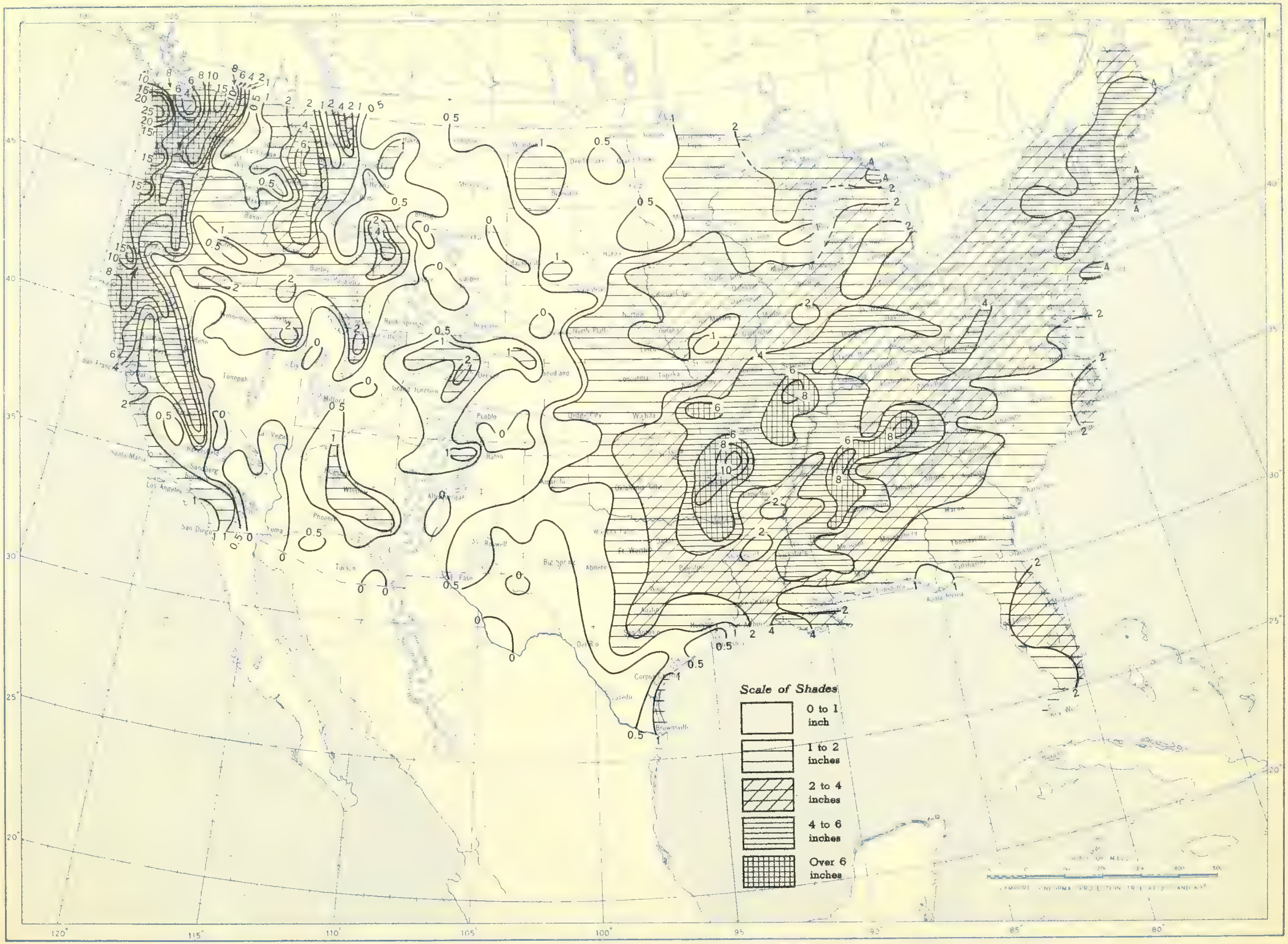
A new station, Schenectady, N.Y., is being added to Table 33 this month and will appear regularly in that table in future editions of this publication. This station is located at the General Electric Company Research Laboratory, The Knolls, Schenectady, New York, and is under the supervision of Mr. Raymond E. Falconer. The station is equipped with a 10-junction Eppley pyrheliometer and a General Electric recording potentiometer. Exposure of pyrheliometer is excellent, with no shading at any time of year. Only slight atmospheric pollution exists when the wind is southeast. Coordinates of the station are: Latitude 42° 50'N., longitude

Chart I. Average Temperature (°F.) at Surface, February 1951. Inset: Departure of Average Temperature from Normal (°F.), February 1951.



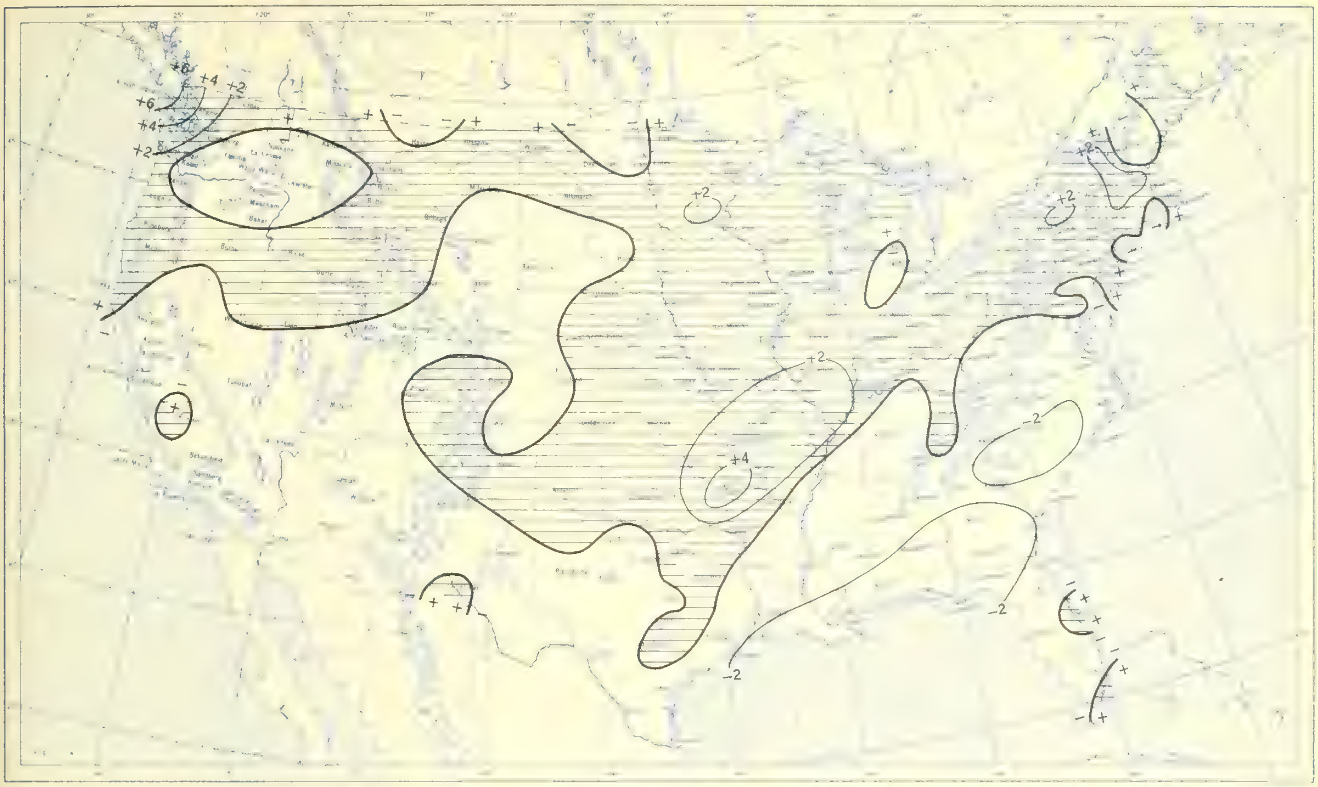
Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), February 1951.

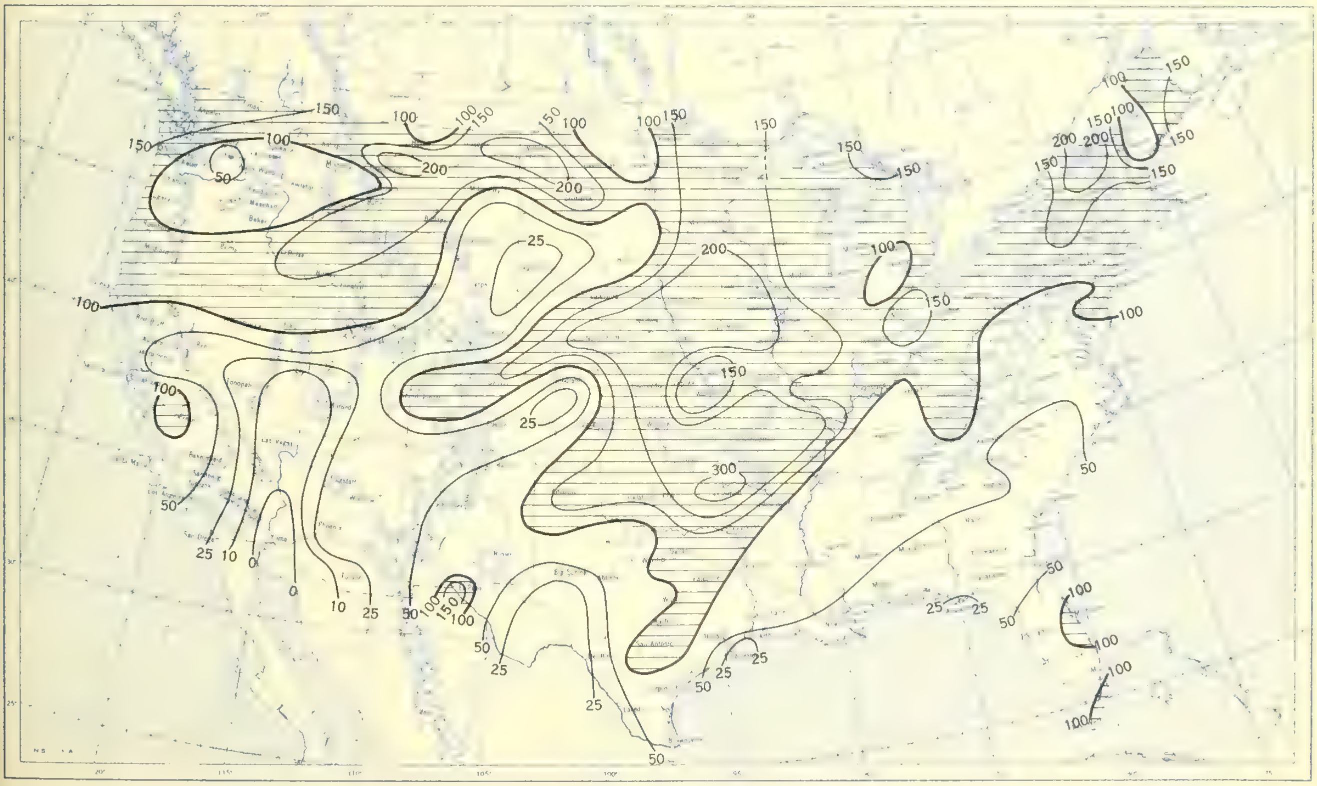


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), February 1951.

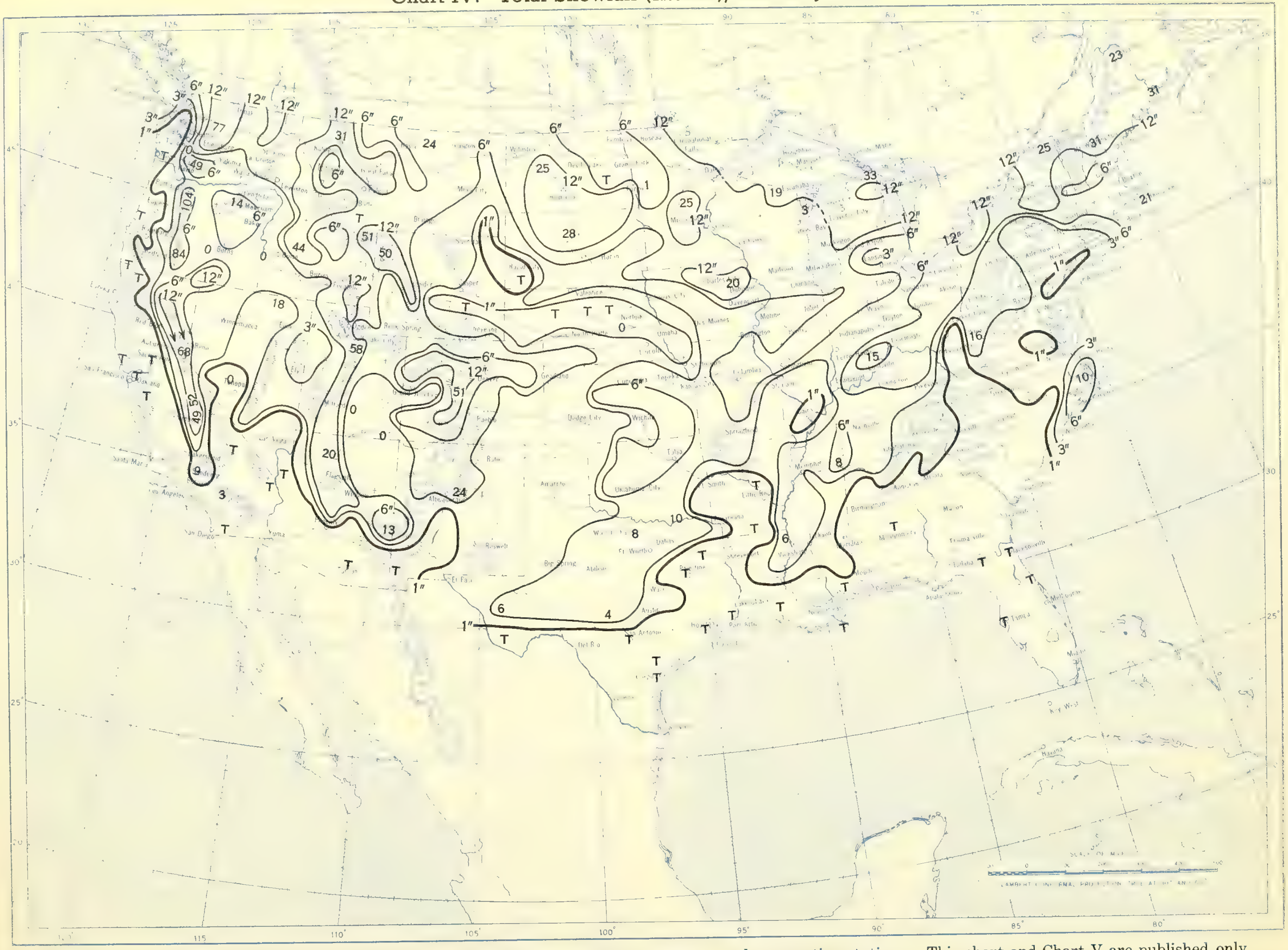


B. Percentage of Normal Precipitation, February 1951.



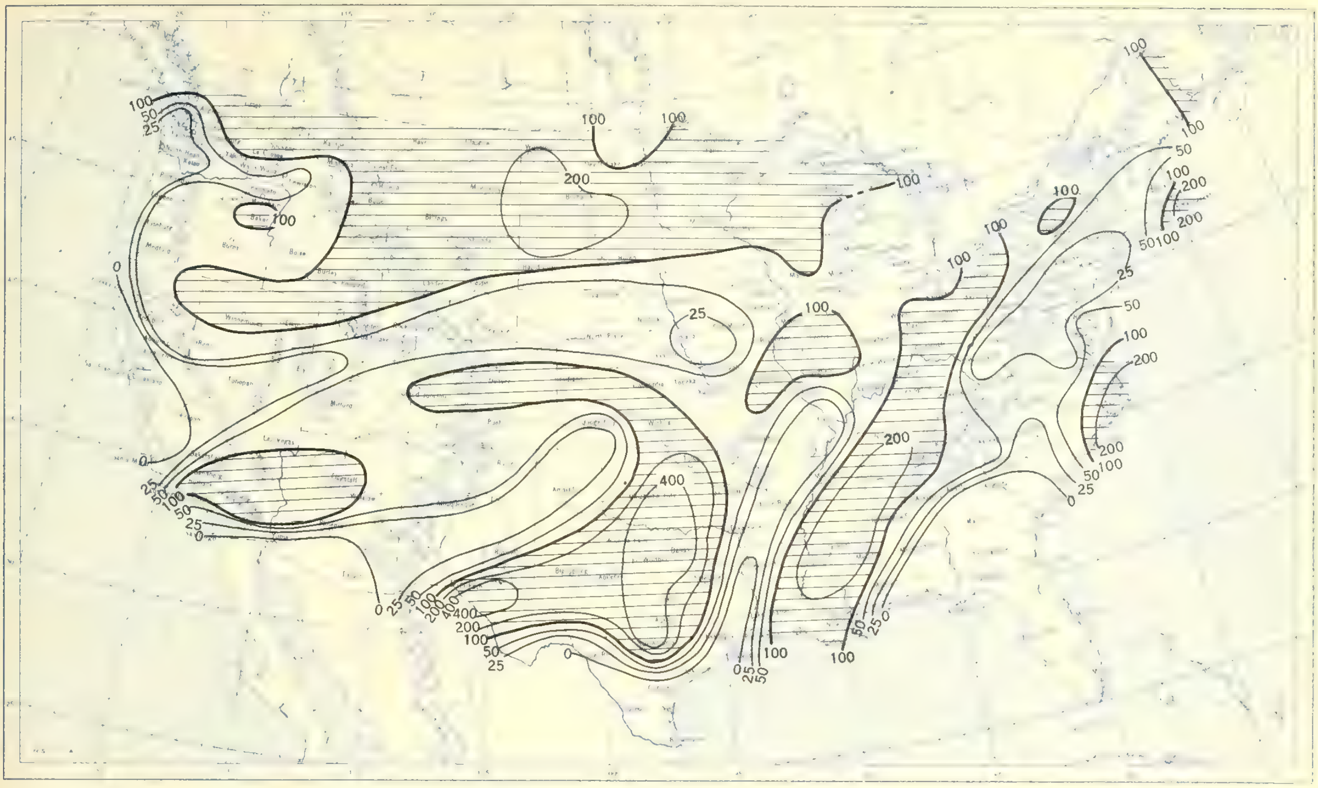
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), February 1951.

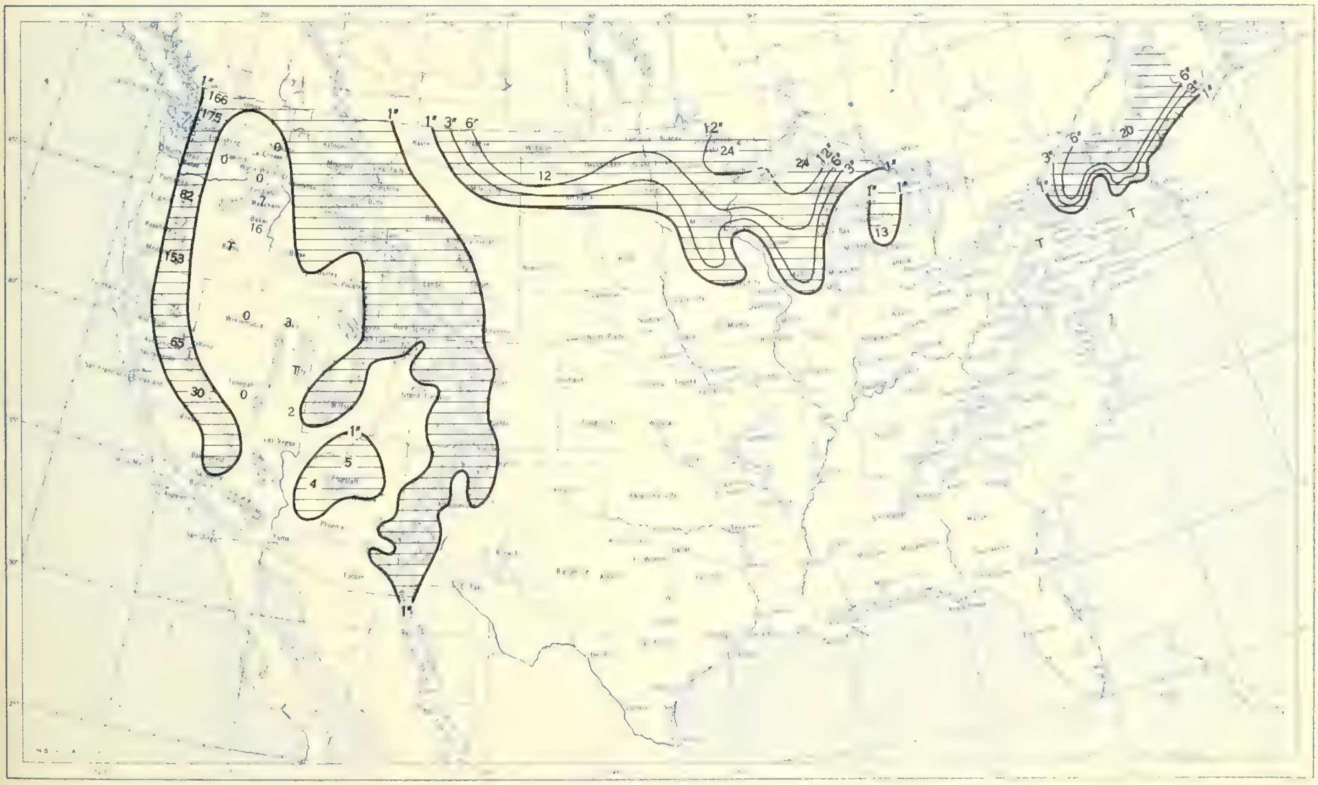


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only

Chart V. A. Percentage of Normal Snowfall, February 1951.

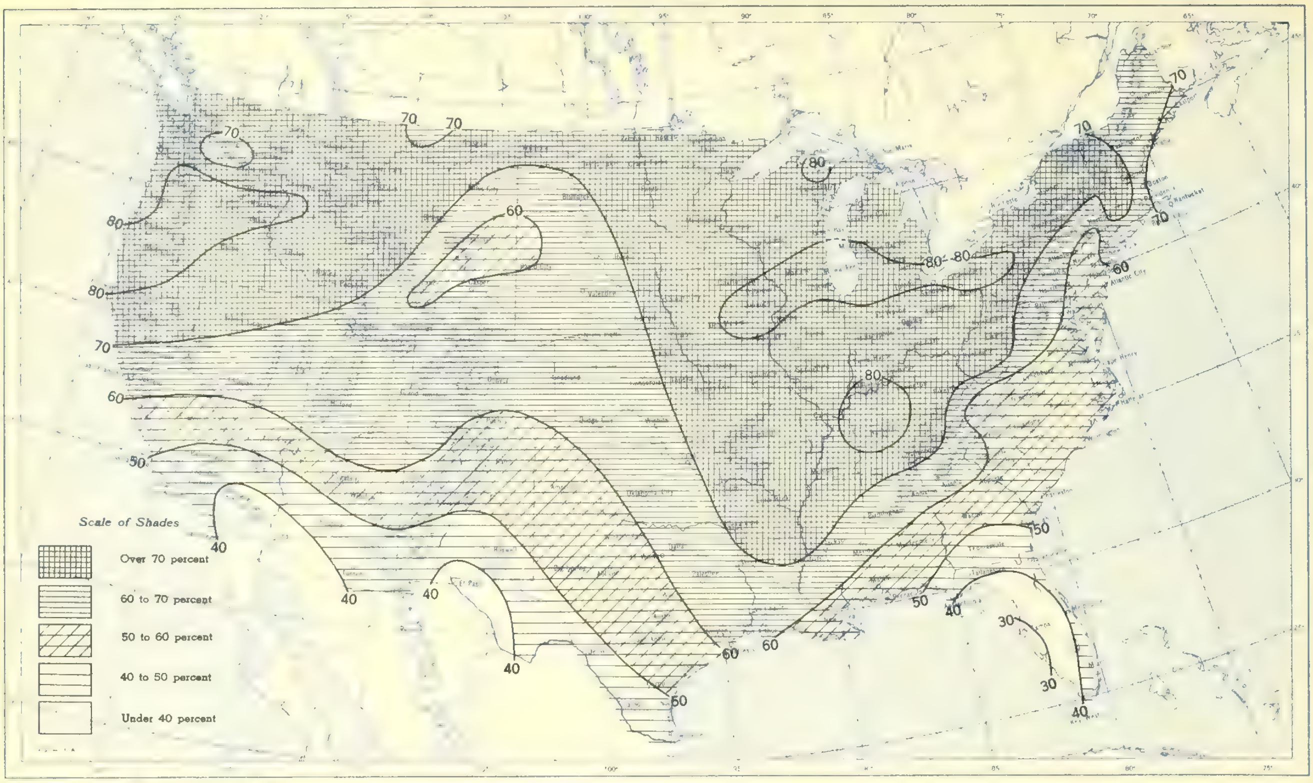


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., February 27, 1951.

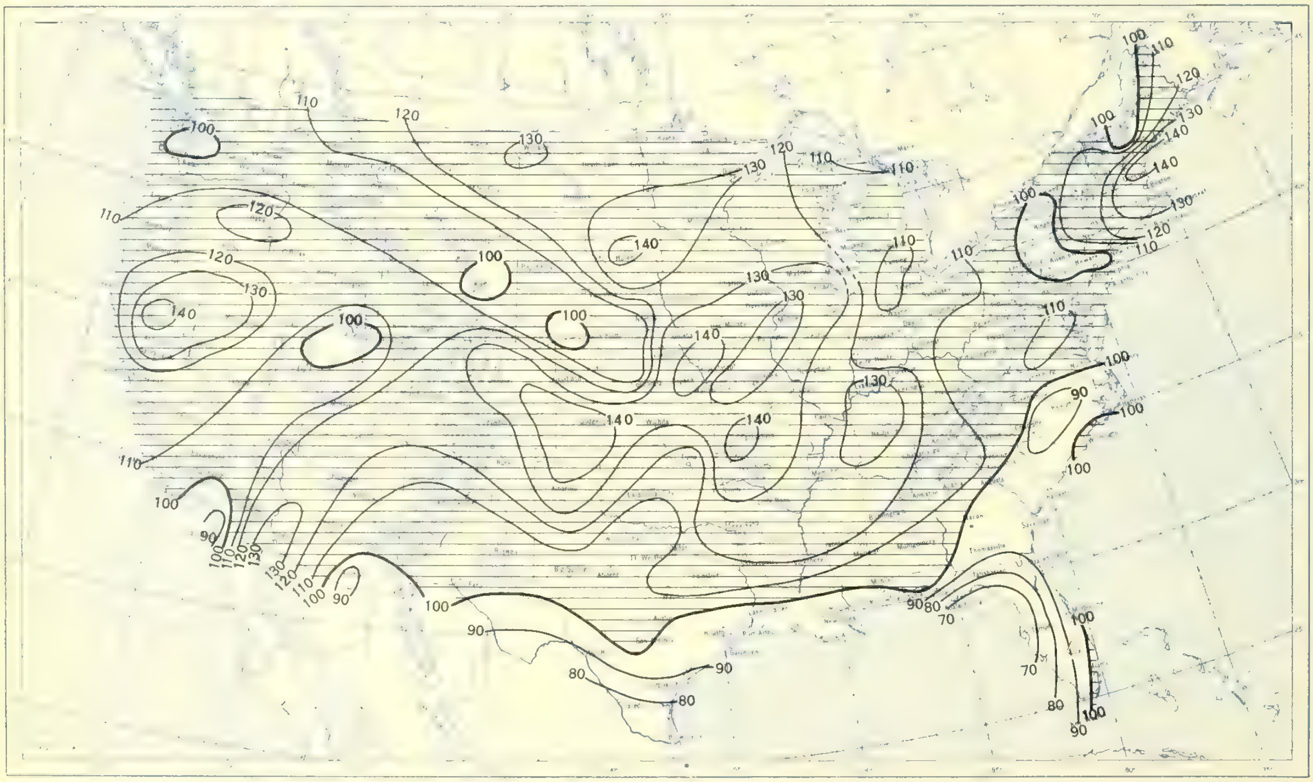


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, February 1951.

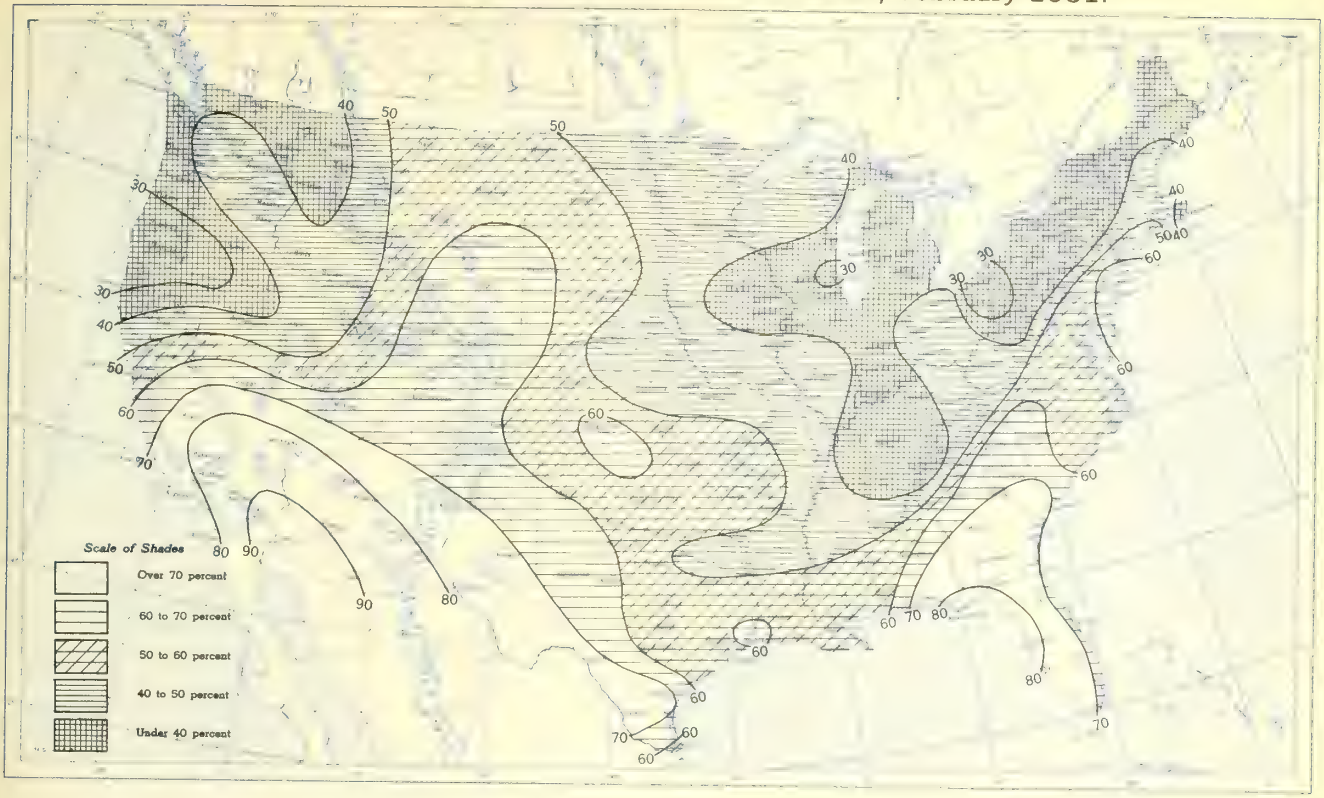


B. Percentage of Normal Sky Cover between Sunrise and Sunset, February 1951.

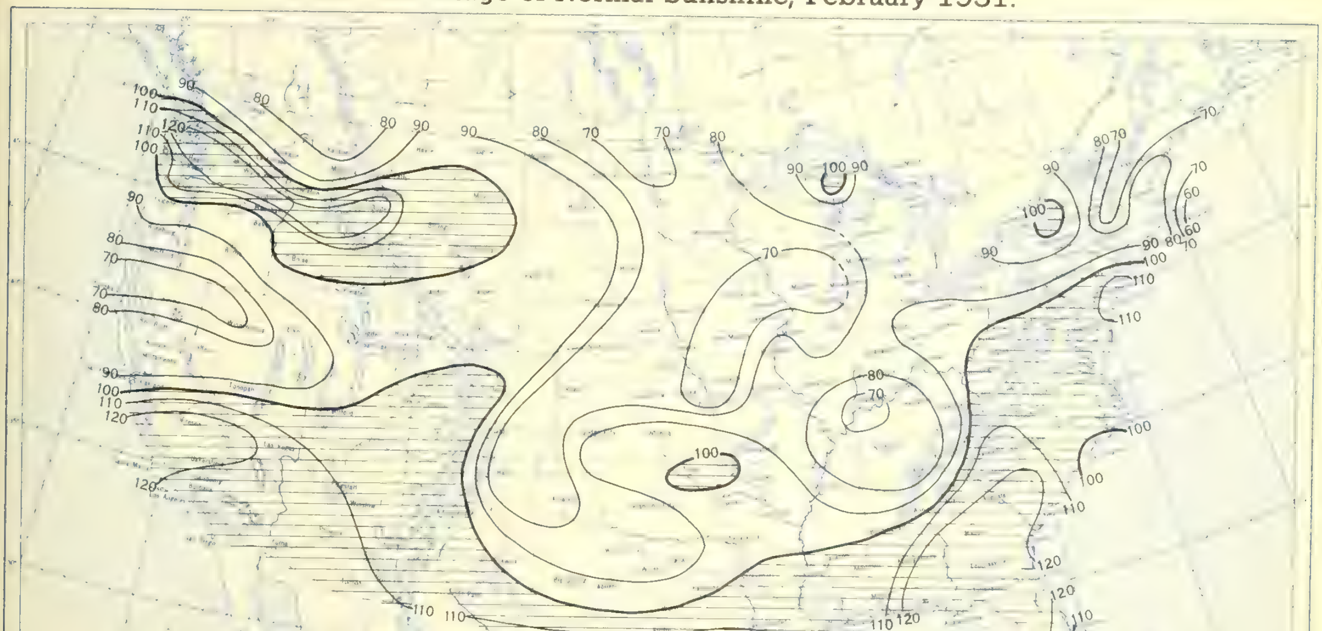


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, February 1951.



B. Percentage of Normal Sunshine, February 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, February 1951. Inset: Percentage of Normal Average Daily Solar Radiation, February 1951.

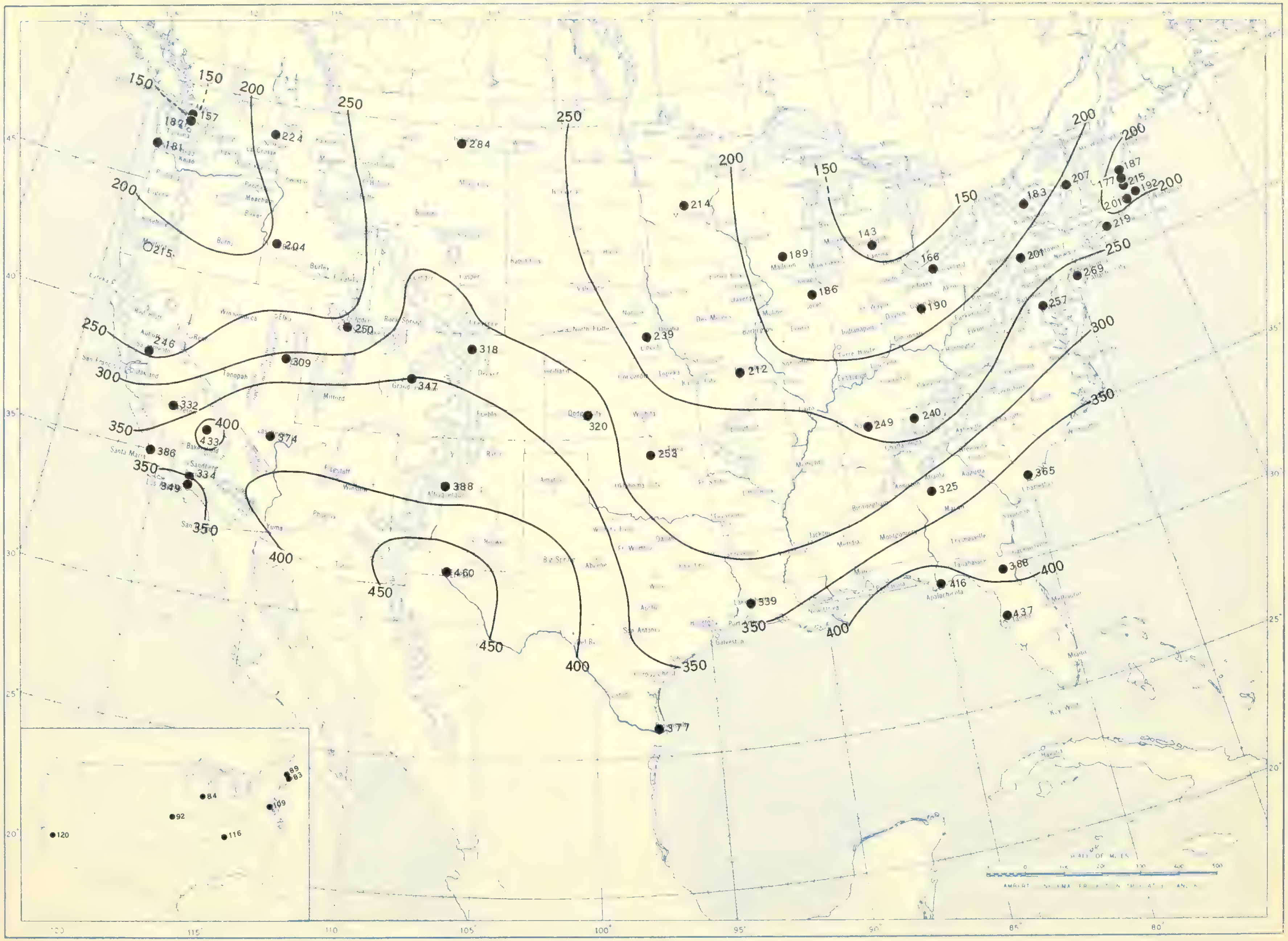
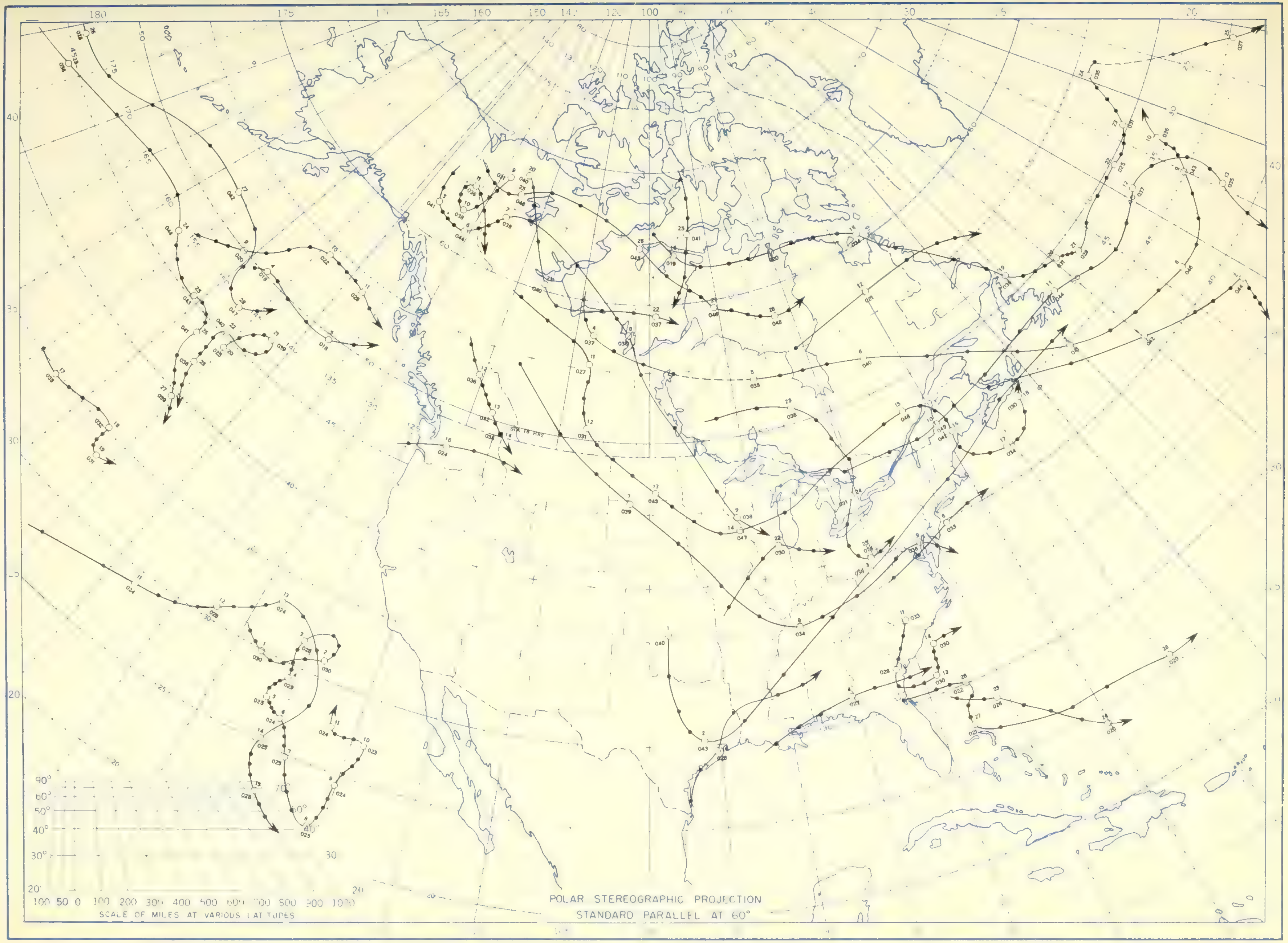


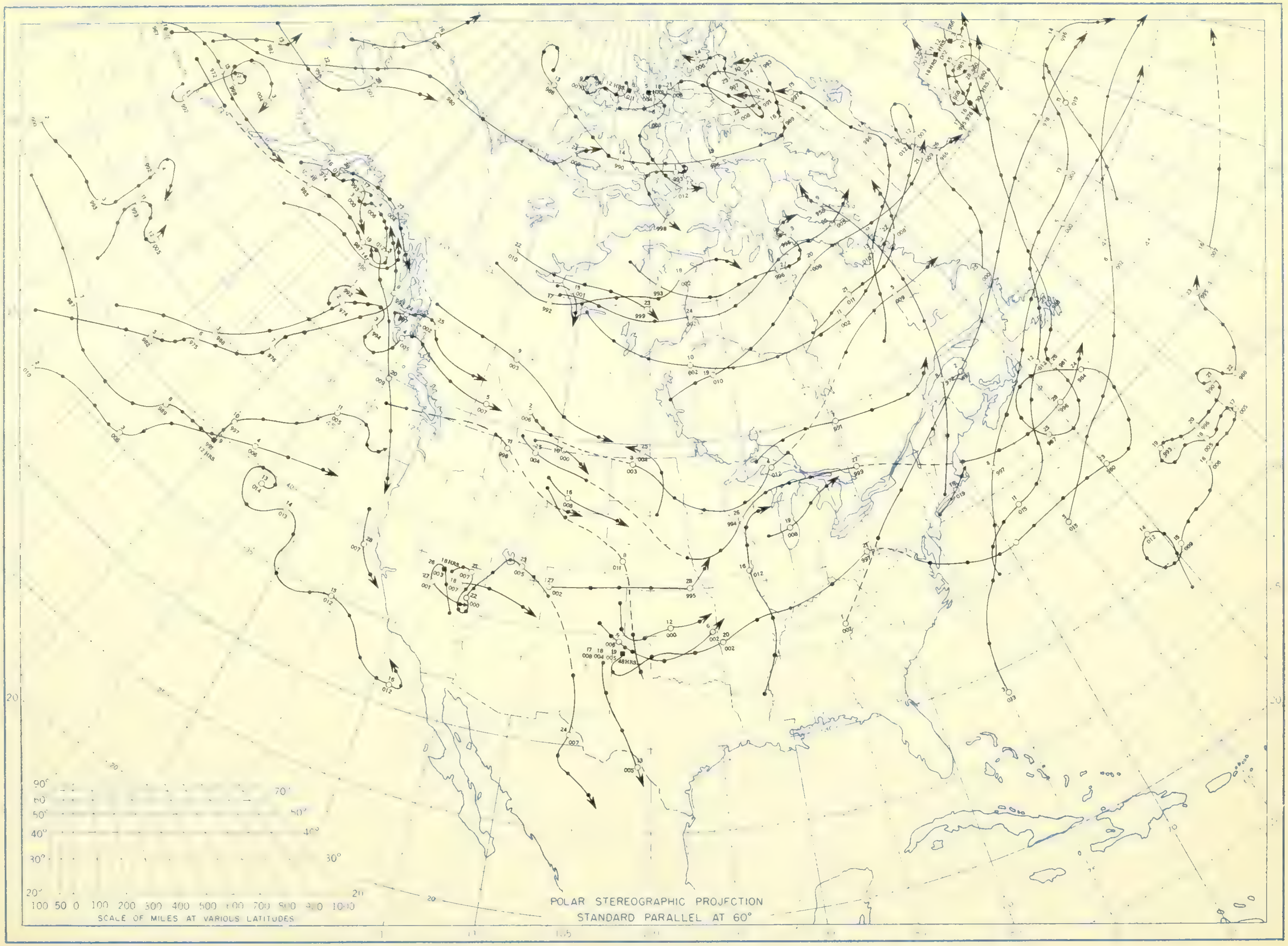
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart IX. Tracks of Centers of Anticyclones at Sea Level, February 1951



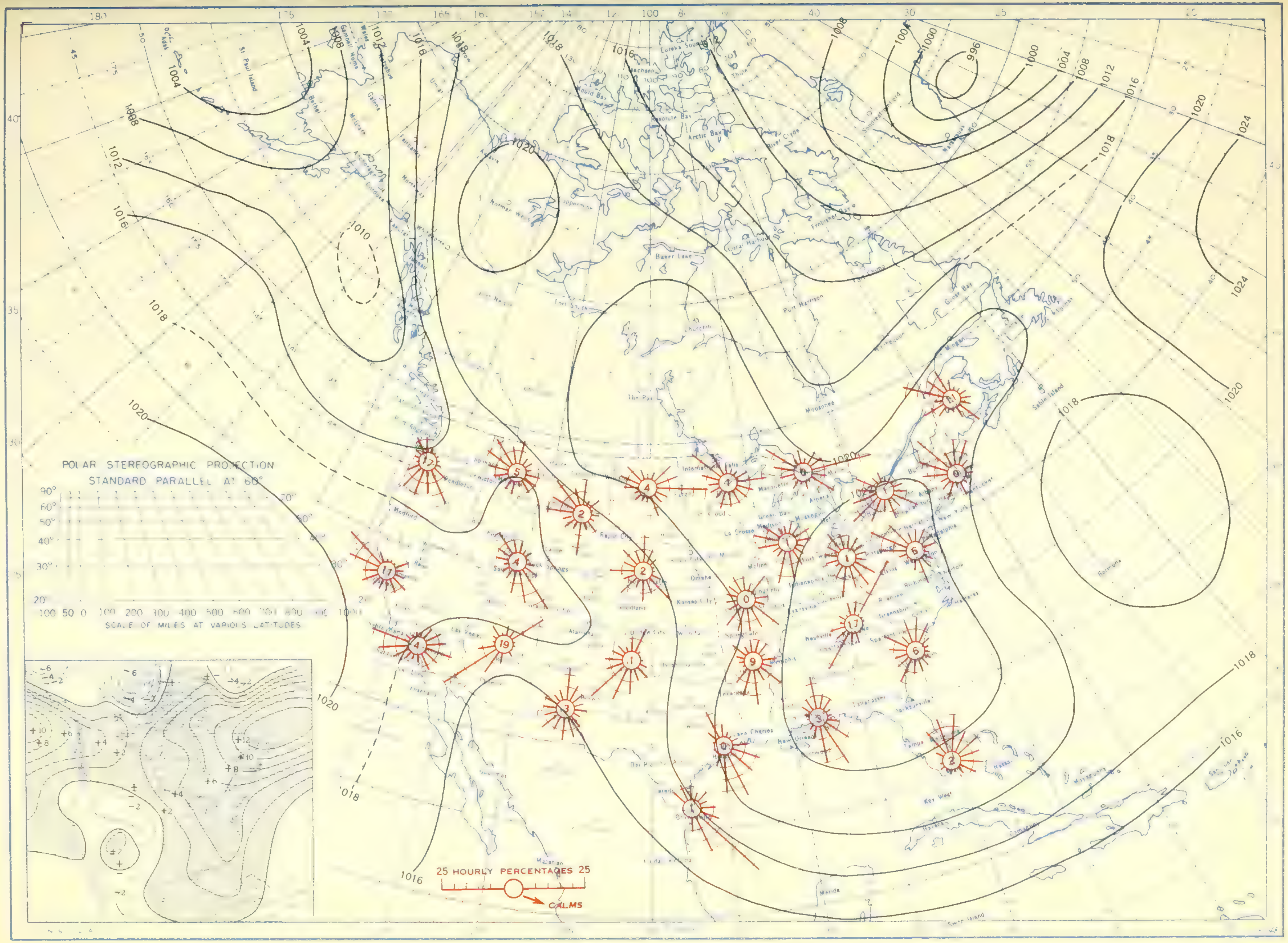
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, February, 1951.



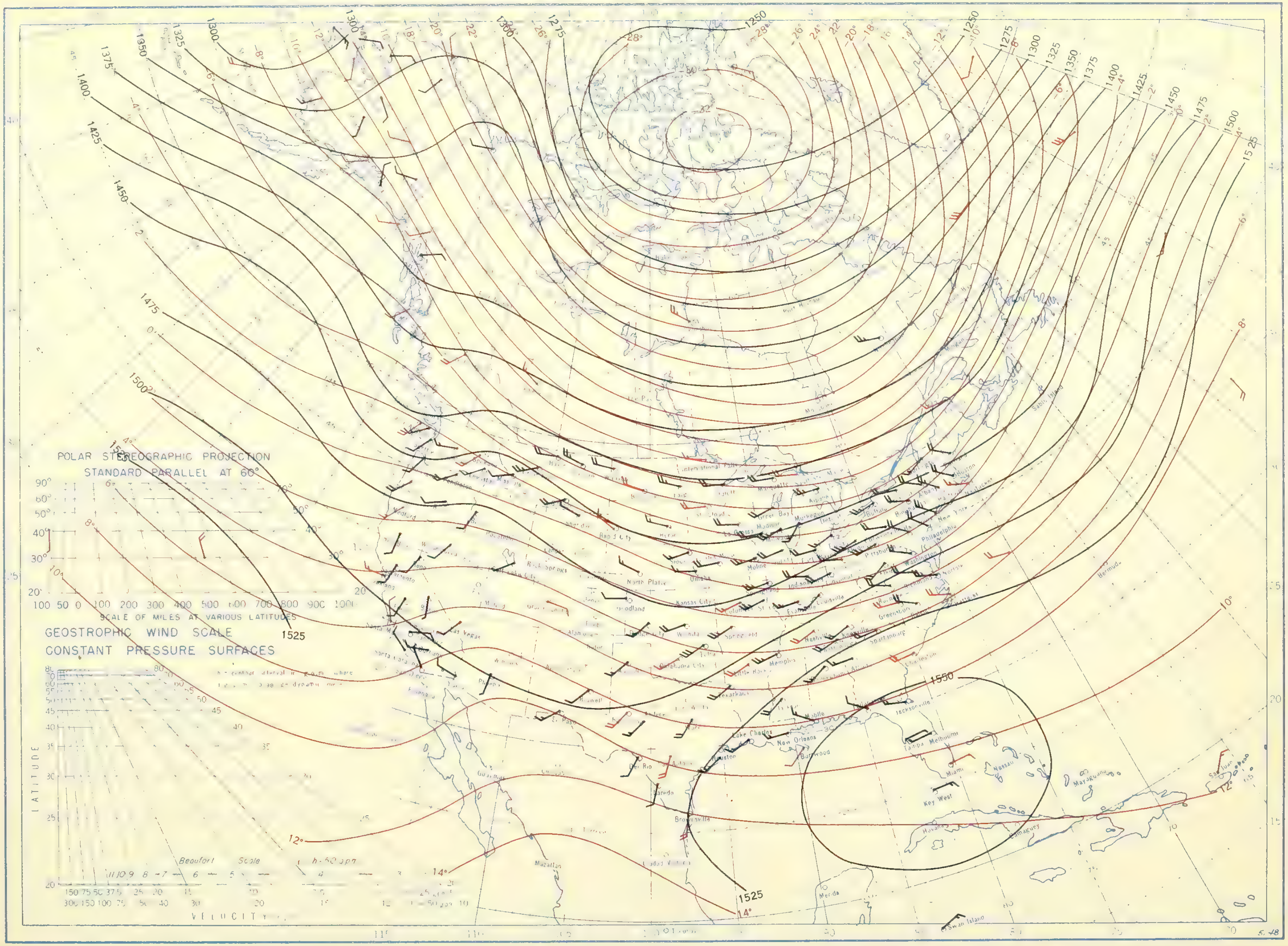
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Average Pressure (mb.) from Normal, February 1951.



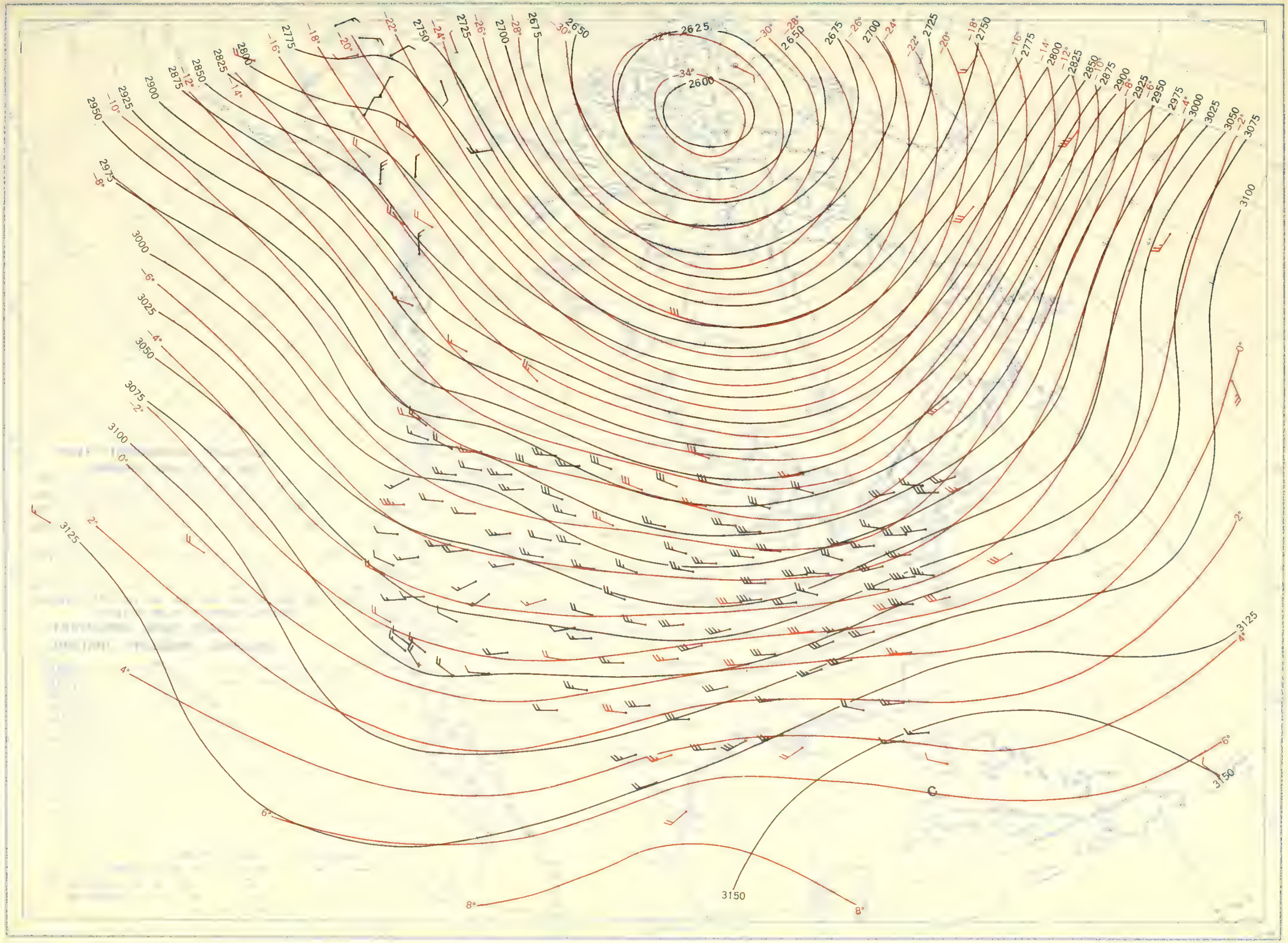
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899-1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), February 1951.



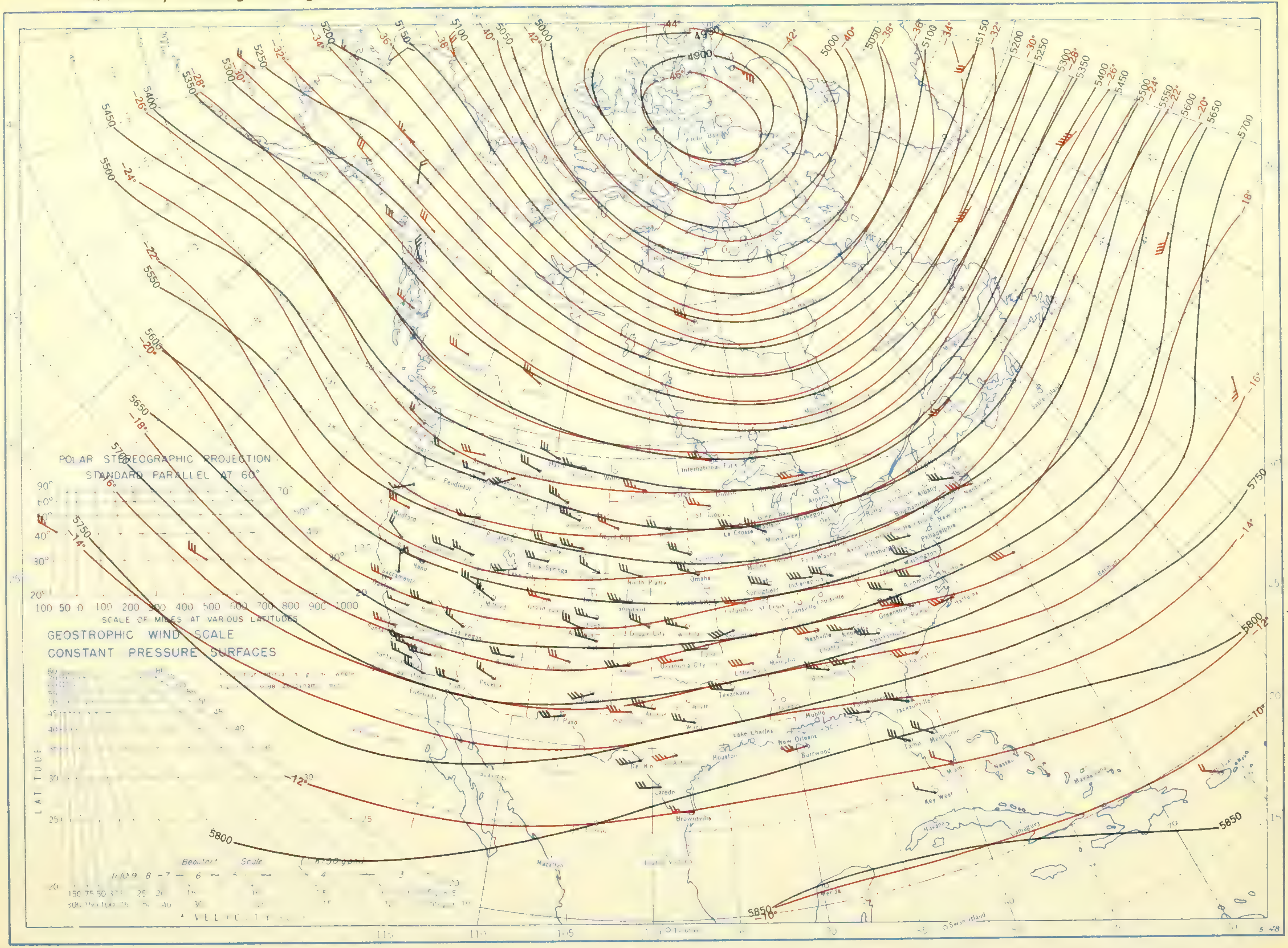
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), February 1951.



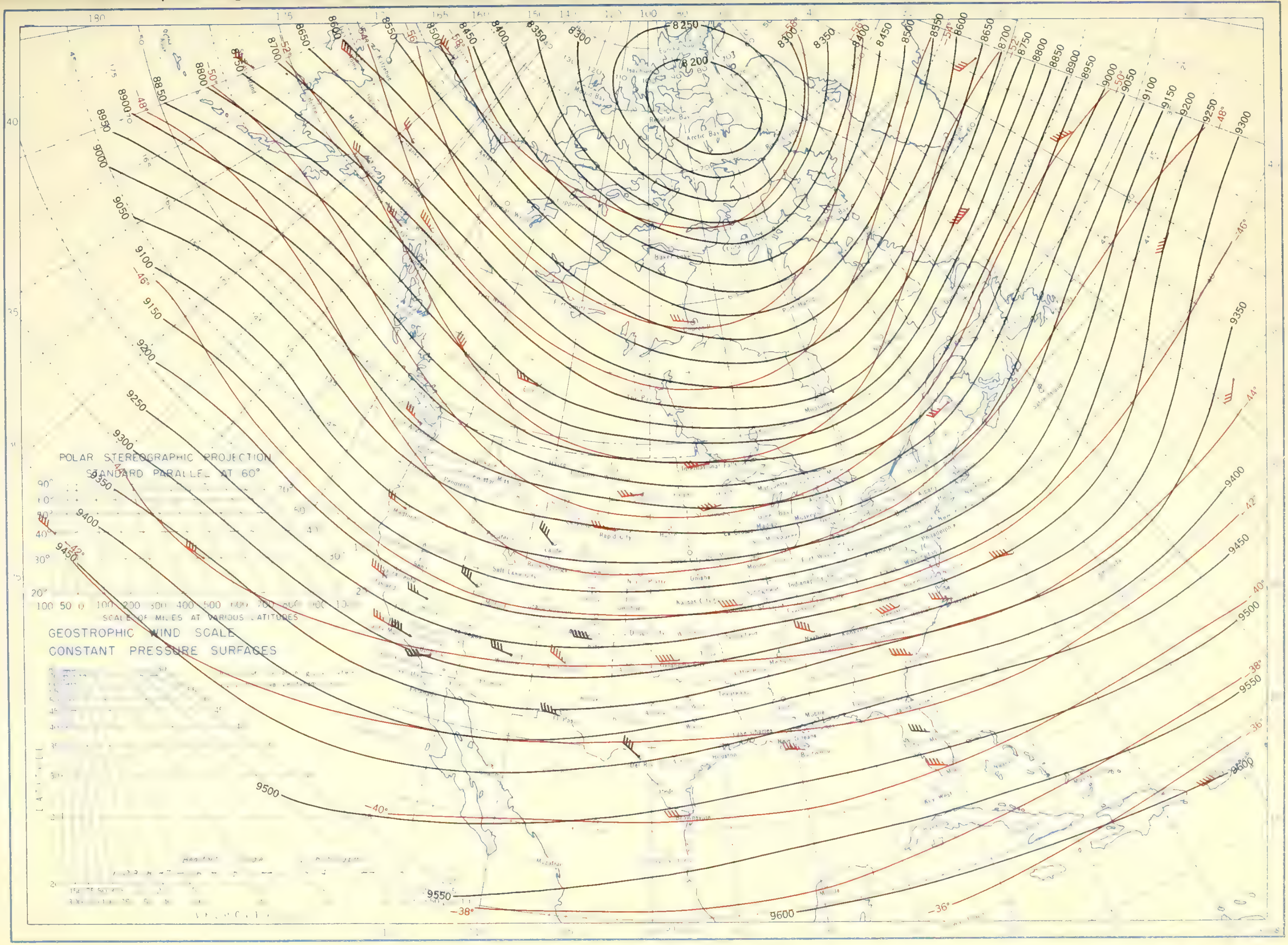
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), February 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), February 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

MARCH 1951
Volume 2 No. 3

NEW ORLEANS: 1951

CONTENTS

SURFACE DATA Page

General Summary of Weather Conditions---------------------- 57

Condensed Climatological Data - States--------------------- 59

Climatological Data - Stations----------------------------- 60

Heating Degree Days-- 65

Severe Storms-- 66

General Summary of River and Flood Conditions-------------- 70

Flood Stage Data--- 73

UPPER AIR DATA

Radiosonde Data-- 75

Pilot Balloon Data--- 78

Rawin Data--- 79

SOLAR RADIATION DATA

Solar Radiation Intensities-------------------------------- 80

Blue Hill Data--- 81

Daily Totals and Average Daily Totals by Weeks------------- 82

CHARTS I-XI

NOTE.—This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA
NATIONAL SUMMARY

Volume 2 No. 3

MARCH 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

The average March temperature for the United States was 40.2°, 2.7° below the long-term mean, the lowest since 1947, and 0.2° lower than that of 1912, the coldest March on record, but 10.9° warmer than that for 1910, the warmest March on record.

Temperatures averaged above normal along the southwestern, southern, and eastern extremities of the country, and in the eastern portion of the Lake Region, but departures generally were less than 1° except in the Northeast where they exceeded 5° at a few scattered stations. Elsewhere, monthly averages were below normal, with departures ranging up to more than 12° in the north-central interior.

In the western two-thirds of the country frequent cold air intrusions kept temperatures below normal much of the time in northern areas and occasionally moved southward with enough vigor to cause freezes in extreme southern areas.

Based on State-average temperatures, this was the coldest March on record in Montana, the coldest in Washington since 1890, and the coldest in the Dakotas since 1899. A low temperature of -12° was recorded in Washington equaling the previous low March record for that State established in 1906 and 1945, and a low of -44° in Montana was only 1° short of the March record for that State.

Freezing temperatures in the Southwest damaged some tender plants in California's lower Sacramento Valley on the 3d and in the Yuma Valley of Arizona on the 3d and 4th. Red Bluff and Fresno, Calif. recorded their lowest March temperatures, 21° and 27° respectively, and a low temperature of -24° in Arizona on the 4th was within 1° of the lowest temperature ever recorded in the State during March. Another freeze in California's Central Valley on the 31st damaged vines and fruit trees as much as 2 or 3 percent in the lower San Joaquin Valley.

A cold wave east of the Rocky Mountains brought a freeze to extreme southern areas on the 13th and 14th. Some early-planted corn and cotton were damaged in Texas on the 13th. On the 14th the freeze killed about 85 percent of the tung blossoms in Louisiana and 10 percent in Mississippi, with a probable loss exceeding one and one-half million dollars. In Louisiana beans, potatoes and strawberries were also damaged to the extent of about $750,000.

The country's average precipitation was 2.56 inches, 0.12 of an inch above the long-term mean. The value for the wettest March was 3.56 inches in 1897, and that for the driest, 1.01 inches in 1910.

From the western portion of the Great Plains to the Pacific Coast, monthly totals generally were below normal, except that an area including northern Oregon, most of Washington, central Idaho, and western and central Montana received amounts ranging rom a few hundredths to over an inch above normal. n much of the Southwest precipitation was much below normal, with many stations receiving none. In some sections soil moisture was very low, and due to unusually light snowfall in the Mountains, the outlook for irrigation was unfavorable.

From the eastern portion of the Great Plains to the Atlantic Coast precipitation generally ranged from slightly below normal to considerably above. Relative to normal southern Florida was the driest area with some stations receiving less than one-third of normal, and while more rain was needed in this area at the end of the month the need was not serious.

The month's greatest totals of precipitation were accumulated in central Gulf areas, due largely to heavy rains on March 18 and 19 and 27 and 28. Okolona, Miss. measured a monthly total of 19.35 inches, 15.00 inches falling in a 48-hour period on the 27th and 28th. For Mississippi the average total precipitation was the third greatest during a 64-year record. Monthly totals exceeding a foot were recorded at a number of stations in Louisiana, Georgia, and Alabama. Considerable flooding that occurred as a result of the heavy rains was particularly heavy in Alabama where the total damage was estimated at more than $2,000,000, and except for timely warnings, would have been much more.

In the Appalachian Region, the Ohio Valley, and northeast monthly totals of precipitation were well above normal. In the Northeast monthly totals ranged up to more than 10 inches in some sections, and were as much as twice the normals. The heaviest rains in this area occurred during the last 3 or 4 days of the month. In the Catskill Region of New York totals for this storm exceeded 6 inches and resulted in severe flooding that caused damage estimated at $2,000,000.

Relative to normal the heaviest precipitation occurred in the upper Mississippi Valley, some stations receiving over three times their normal amounts. Most of this was snow, which was record-breaking, with a water equivalent exceeding 6 inches at some stations. These actual totals were less than those in central Gulf areas, but normals in north-central areas are also much less than those along the Gulf. Averages for Minnesota and Iowa set new March records for those States. Rapid melting of a heavy snow-cover during the last week caused flooding in several tributaries of the Missouri and Mississippi Rivers, particularly in North Dakota and Iowa.

The North Pacific Coast received heavy precipitation on March 3 and 4 and 8 and 9, and in western Washington again on the 11th and 12th as deep Lows moved in from the Pacific.

Heavy 24-hour amounts of precipitation fell in parts of Minnesota and Iowa and parts of surrounding States on the 1st and 3d as successive Lows passed from the Southwest into the Lake Region. Heavy amounts also fell in the Ohio Valley on the 3d. Precipitation associated with a cold front was heavy in Missouri, Iowa, Oklahoma, and some adjacent areas on the 10th and 11th.

Heavy precipitation in the upper Ohio Valley and the central Appalachian Region on the 13th and 14th and parts of New England on the 14th and 15th was associated with low pressure areas that formed along a weak cold front in the Mississippi Valley. As a Low moved from the Southwest to the Lake Region from the 17th to the 19th, heavy precipitation fell in central Missouri on the 17th and in the central and lower Mississippi Valley on the 18th. A trailing cold front from this Low was accompanied by heavy rains as it crossed the central Gulf States on the 18th, and from southern New England to northeastern North Carolina as it crossed the Atlantic Coastal States on the 19th. From the 25th to 27th a strong flow of moist Gulf air over the central portions of the country caused heavy rains in eastern Texas and in Louisiana. On the 27th a frontal Low over the lower Great Plains gained moderate intensity in advance of a cold air mass from the west as it moved northeastward over the Lake Region by the 30th. As the cold air moved across the eastern States moderate to heavy precipitation, in the form of rain except in some extreme northern areas, was general from the Mississippi Valley to the Atlantic Coast.

March snowfall was much above normal in the Pacific Northwest and northern Rocky Mountain Region, and from the central portion of the northern Great Plains eastward to western Pennsylvania and West Virginia and southward to central and eastern Missouri and western Tennessee. Snowfall was slightly above normal in another area that included the northwestern half of Kansas, central and southern Colorado, northern New Mexico, and most of central and northern Arizona. In the Appalachian Region and Northeast, the western portion of the northern Great Plains, much of the central Rocky Mountain Region, and in California and southern Nevada, monthly totals ranged from slightly to much below normal.

In the Northwest snowfall was unusually heavy west of the Continental Divide, particularly west of the Cascades and in the lower Columbia River Basin. This area received most of its snow during the first decade as deep Lows from the North Pacific lingered in the vicinity of northwestern Washington and Vancouver Island. Idaho's average was nearly double the 53-year mean, and was the greatest March average since 1917. Washington's March average of 22.7 inches was the greatest of record, the previous record of 16.2 inches occurring in 1916. For Oregon the monthly average of 18.2 inches was a new record, nearly twice that for any other March in the past 34 years and four times as great as the long-term mean. At low-level stations west of the Cascades and in the lower Columbia Basin totals for the first decade ranged up to 20 or 30 inches, and at many stations totals were equal to the average annual amounts. Portland, Oreg. recorded its greatest March total since 1874.

In some north-central areas snowfall was also record-breaking. Minnesota's average of 29.3 inches was the greatest for March since the beginning of state-wide records in 1891. Wisconsin's average of 22.6 inches was not only the greatest for any March but exceeded that for any other month except January 1929. A March record for Iowa, 23.2 inches, was four times as much as usual. Although not records, North Dakota's average was 6.3 inches more than usual, and Michigan's was 4 inches more. The greatest monthly totals recorded in the following States were: Minnesota, 49.8 inches; Michigan, 46.9; South Dakota, 38.6; North Dakota, 37.5; and totals exceeded 40 inches at several stations in northern Iowa.

Snowfall was frequent in north-central areas during the first three weeks and was often accompanied by strong winds. Blizzard conditions prevailed in South Dakota on the 2d, North Dakota on the 5th and 17th, and also in northeastern Montana on the 17th where reports indicated the worst blizzard in that area in many years.

Unusually heavy snow fell in northwestern Lower Michigan on March 23 and 24. An extreme total for the storm measured 33 inches at Detour, and 15 to 25 inches were reported from several other stations. An account of this storm, as given by the observer at Frankfort, Mich., appeared in the Climatological Data for Michigan as follows: "Storm began at 2:20 p.m. on 23d. Hail lasted 20 minutes, then turned to snow with rising winds from the north. Very heavy thunder and lightning lasted until about 10:30 p.m. Roads reported blocked by wet, blowing snow by 10:00 p.m. throughout the county. Storm broke at about 3:30 a.m., the 24th. Blowing snow continued until 6:15 a.m. Many people spent the night in their cars. No loss of life or property reported."

Throughout the area of heavy snow roads and highways were frequently blocked, some secondary roads remaining blocked most of the month, and at times all air, rail, and bus traffic was halted. Many schools were forced to close. In Iowa at least 18 deaths were attributed to these storms. At Minneapolis, Minn. and in the southern portion of the State some roofs collapsed under the weight of the snow. Local areas of both North Dakota and Minnesota were isolated by the deep snow, some counties being designated by authorities as emergency areas. Two of the chief economic factors were the loss of business and the great cost of snow removal. Snow removal in Minneapolis, St. Paul, and Duluth cost a total of near one and one-half million dollars.

The heaviest snowstorms in this area probably occurred on the 2d and 3d and the 17th and 18th, although heavy snow fell in various areas on the 12th and 13th, 23d, and 31st. Farther south in the lower Great Plains, the Ohio Valley, and southern States most snow fell during the period March 10 to 14. On the 13th snow fell as far south as Mobile, Ala. and Crestview, Fla.

In the Northeast snowfall was greater than during February, but was still below normal. In northern New England, however, frequent light to moderate amounts were adequate for winter sports. This is the third consecutive season that snowfall has been below normal in the northeastern United States.

By the end of the month the snowcover in the Northeast was confined to the Mountains of New England and northern New York. In the far West the snowcover was confined to the mountains. In north-central areas, Minnesota, much of Iowa, North Dakota and Wisconsin, northern Michigan, and extreme northeastern Montana were still covered at the end of the month with depths, that had ranged up to more than 2 feet during the first 3 weeks, being reduced by warm weather during the last week to a few inches. A depth of 27 inches at Minneapolis, Minn., on the 18th was the greatest depth since 1917, and a 14-inch depth at Duluth, Minn., on the 31st was the greatest depth at the end of March at this station since 1882.

Mostly fair weather prevailed in the far West after the 16th, and sunshine was above normal in the northern portion of the western Great Plains and the Southwest including California. In the central and eastern portions of the country, however, sunshine was less than normal and there was more than the usual cloudiness.

Severe storms resulted in fewer deaths and less damage than usual for March. Only 7 tornadoes were reported, but no lives were lost and damage was only about $150,000. In only five previous Marches during the last 35 years has the death toll and total damage been so low. Temperature was the most damaging weather element, mainly as a result of the freeze in Louisiana and Mississippi.

From the central and northern Rocky Mountain Region to the Appalachians, cold, wet weather generally caused a delay of 1 to 3 weeks in the beginning of early spring agricultural activities. In the Midwest oat sowing had begun in only a few areas. In Illinois, for instance, only 1 percent of the intended oat acreage was sown compared to 25 percent normally, while some early-sown oats in northeastern Missouri rotted. Grains and grass were greening, but growth was slow. Soil moisture was ample in most of this area. The weather was ideal for maple sugaring in Michigan, but only fair in Indiana and New York. Winter grains were in mostly good condition.

On the East Coast weather conditions were more favorable. Soil preparation made good progress in central and southern areas, and some plowing was accomplished as far north as southern New England. Grains, however, were reported as only in fair to good condition. Soil moisture was ample.

The most unfavorable weather condition in respect to agriculture was the drought in parts of the Southwest and in the western portion of the lower Great Plains. In southwestern Kansas and western Oklahoma winter grains were in poor condition due to the drought which had continued through the fall and winter, insects, and winter freezes. Abandonment of wheat acreage in these areas was above normal, exceeding one-half of the seeded acreage in some sections of western Oklahoma. Also in New Mexico and Colorado winter grains were only poor to fair and were suffering from drought and insects, with rains badly needed and many fields being plowed up. The water outlook in New Mexico and the southern half of Utah was generally unfavorable.

On the West Coast work was delayed in the north by frequent precipitation the first half of the month, but made good progress the latter half. Grains were suffering from lack of moisture in southern California, although other crops in this area were generally satisfactory.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

MARCH 1951

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F		In.	In.		In.		In.
Alabama	57.1	+1.1	2 stations	87	°1	7 stations	24	°16	9.10	+3.31	Gorgas	13.94	Tuskegee	3.14
Arizona	49.7	-.7	4 stations	91	°24	Maverick	-24	4	.50	-.49	Crown King	2.65	3 stations	.00
Arkansas	51.3	-1.1	2 stations	87	°6	Harrison	11	13	2.40	-2.36	Crossett	7.21	Black Rock	.67
California	50.9	-.9	Mecca	96	25	Soda Springs	-20	3	1.36	-1.56	Gasquet R.S.	9.15	13 stations	.00
Colorado	32.9	-1.5	Eversoll Ranch	83	22	Taylor Park	-30	1	.65	-.72	La Veta Pass	4.31	3 stations	.00
Connecticut	37.9	+2.1	Waterbury	67	28	5 stations	12	°11	5.96	+1.93	Putnam Lake	9.38	Falls Village	4.07
Delaware	42.9	-.7	Bridgeville	72	29	Millsboro	17	27	3.46	-.35	Lewes	4.50	Bridgeville	2.41
Florida	65.9	+.6	3 stations	90	°9	Carrabelle	26	14	3.21	-.15	Cantonment	12.32	Lake Trafford	T
Georgia	56.7	-.2	5 stations	83	°2	2 stations	22	°14	6.03	+1.03	Flat Top	13.95	Macon	2.99
Idaho	31.5	-4.2	2 stations	70	°21	Island Park Dam	-34	11	1.39	-.29	Roland W. Portal	6.16	Hamer 4NW	.11
Illinois	37.8	-3.2	Sparta	80	23	Stockton	4	21	3.53	+.33	New Boston	6.40	Rockford	1.56
Indiana	39.8	-1.7	Albion	79	7	Frankfort Disposal	-2	21	3.57	-.16	2 stations	7.01	Frankfort	1.11
Iowa	27.5	-8.2	Shenandoah	76	26	3 stations	-10	21	4.20	+2.51	Tripoli	6.80	James	1.57
Kansas	39.4	-1.7	3 stations	85	22	Centralia	-5	21	1.43	+.02	Horton	5.23	Scott City 14N	.00
Kentucky	45.4	-1.0	Ashland Dam 29	79	29	Grayson	13	26	4.99	+.24	2 stations	6.86	Paducah	3.11
Louisiana	60.8	+.9	Covington	91	8	Natchitoches	23	13	6.77	+1.76	Hammond	15.33	Robeline	1.90
Maine	30.3	+1.3	Corinna	64	29	Fort Kent 1SE	-24	1	3.95	+.49	Portland	9.19	Presque Isle	1.24
Maryland	43.1	+.3	Cumberland Pol.Brks.	76	23	Sines Deep Creek	11	°11	3.14	-.40	Tonoloway	5.99	Ocean City	1.93
Massachusetts	36.9	+1.7	Lake Cochituate	72	29	West Cummington	6	27	4.70	+.93	Chesterfield	7.01	New Bedford	2.98
Michigan	30.3	+.7	Three Rivers	70	6	2 stations	-19	26	2.60	+.56	Fayette Sack Bay	5.47	Grand Ledge	.70
Minnesota	18.5	-7.4	Winona	59	28	Itasca State Park	-26	9	2.52	+1.32	Bricelyn	5.32	Hallock	.47
Mississippi	57.8	+.9	Leakesville	88	11	9 stations	26	°13	9.18	+3.16	Okoloma	19.35	Lake Comorant	2.88
Missouri	41.0	-3.5	Camdenton	84	6	Hermitage	2	21	3.37	+.10	Hannibal	8.87	Seneca	.78
Montana	20.1	-10.3	Yellowtail Dam	69	26	Big Sandy	-44	8	.87	-.04	Summit	3.93	Ingomar 23NE	T
Nebraska	31.5	-5.0	5 stations	83	°22	Chadron 4W	-11	8	1.34	+.20	Plattsmouth	5.58	Benkelman	.05
Nevada	39.4	-2.1	Las Vegas	85	25	Owyhee	-11	10	.42	-.49	Jarbidge	2.03	3 stations	.00
New Hampshire	32.0	+3.0	Nashua 3N	69	29	First Cann Lake	-13	27	4.74	+1.38	Durham	3.32	Bethlehem	1.99
New Jersey	41.1	+.6	Runyon	63	°23	Layton 3NW	11	27	5.39	+1.62	Greenwood Lake	10.38	Canton	2.29
New Mexico	43.5	-.3	2 stations	85	°7	2 stations	-16	°4	.53	-.23	Villanueva	3.33	3 stations	.00
New York	34.1	1.8	Hemlock	70	30	Schroon Lake	-5	10	4.30	1.22	Peekamoose	11.18	Ogdensburg	1.06
North Carolina	50.0	.0	Lexington	85	8	Mt. Mitchell	3	11	4.26	+.06	Hyatt Creek	13.81	Enfield 3S	2.13
North Dakota	12.5	-12.2	Marmarth	59	26	Grenora	-38	11	.57	-.21	McLeod	2.93	5 stations	T
Ohio	39.7	+.7	Philo	79	29	Kenton 2W	5	22	1.36	+.90	Clarington Lock 14	6.43	Toledo	2.15
Oklahoma	49.3	-1.5	Waurika	92	22	Kenton	0	19	1.37	-.91	Smithville	4.11	Kenton 6N	.19
Oregon	37.4	-1.4	Powers	74	19	Seneca	-19	11	3.27	+.37	Timberline Lodge	16.19	Rome	.20
Pennsylvania	38.1	+.4	Bakerstown 4WNW	77	6	Bradford 4W Res. 1	2	26	4.51	+.99	Pimple Hill	9.72	Holtwood	1.85
Rhode Island	38.7	+2.1	Providence CO	68	23	Kingston	16	27	5.04	+1.00	Austin	6.25	Block Island CO	3.95
South Carolina	54.6	-.3	Ridgeland 2SE	89	[illegible]	Caesars Head	19	14	4.91	+.92	Caesars Head	9.09	Moncks Corner 3N	2.80
South Dakota	21.0	-10.3	Gregory	77	26	Camp Crook	-25	8	1.12	+.01	Wentworth	3.16	Willett	.12
Tennessee	49.7	+.2	3 stations	81	2	Crossville Exp. Sta.	16	22	5.84	+.47	Jasper	11.23	Samburg Wildlife Refuge	1.99
Texas	57.4	+.3	Rio Grande City	97	24	Dalhart Exp. Sta.	11	13	1.98	+.13	Agua Nueva	7.42	2 stations	.00
Utah	36.6	-1.6	Hite	83	22	Woodruff	-20	11	.75	-.61	Silver Lake Brighton	5.20	Piute Dam	.00
Vermont	31.0	+2.2	2 stations	66	°28	West Burke	-5	27	3.83	+.91	Mays Mill	7.21	Gilman	2.29
Virginia	45.0	+.3	Buggs Island Dam	82	8	2 stations	9	°10	3.79	+.17	Montebello Fish Nrsy.	7.20	Dahlgren Proving Grounds	1.86
Washington	36.4	-4.2	Sunnyside	74	21	Chewelah 2S	-12	11	3.37	+.36	Rainier Paradise R.S.	17.06	Prosser 4NE	.13
West Virginia	42.7	+.2	Vienna Briscoe	78	8	Shady Springs 2ESE	5	17	4.96	+1.06	Clay No. 1	9.15	Moorefield	2.87
Wisconsin	25.0	-3.5	Kenosha	65	6	Grantsburg	-23	9	3.31	+1.69	2 stations	5.58	Ashland	1.26
Wyoming	26.6	-3.2	2 stations	73	°26	Bondurant	-34	11	.82	-.30	Bondurant	6.50	Newcastle 15SSE	T
Alaska*	-3.3	-9.6	Lincoln Rock	54	7	3 stations	-69	°15	1.26	-.54	Little Port Walter	18.73	2 stations	T
Hawaii**	63.8	-.4	2 stations	89	°20	Kamuela	34	9	9.73	+3.03	Makahanaloa	43.00	Hanaunau	.74

°Other dates also.
*January 1951.
**February 1951.

CLIMATOLOGICAL DATA

Table 2

MARCH 1951

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
ALABAMA																																	
Birmingham	610	991.9	1017.3	65	44	54.7	+0.9	81	3	23	16	0	9	44	72	11.42	+5.72	5.39	13	3	T	T	10.0	S	34	SW	23	4	6	21	7.9	41	326
Mobile CO	10	------	------	70	53	61.6	+1.9	82	8	33	13	0	0	--	--	11.39	+5.41	6.52	9	2	T	0	13.3	---	43	SE	28	9	7	15	6.2	46	165
Mobile	211	1009.1	1017.1	71	51	61.1	-----	84	9	32	13	0	1	51	75	11.83	-----	6.52	11	7	T	T	12.3	SSE	--	---	--	8	7	16	6.4	--	137
Montgomery CO	201	------	------	--	--	----	-----	--	--	--	--	-	--	--	--	----	-----	----	--	-	----	--	----	---	--	---	--	--	--	--	----	--	237
Montgomery	198	1009.5	1016.8	69	47	58.4	+.6	84	3	30	16	0	2	46	68	4.04	-1.95	1.96	10	4	T	0	9.2	S	38	S	23	6	9	16	6.6	57	244
ARIZONA																																	
Flagstaff	6993	784.3	1016.3	49	21	34.6	-----	63	25	0	4	0	31	15	48	.91	-----	.73	4	0	12.9	13	10.3	SW	--	---	--	15	5	11	4.5	--	936
Payson CO	5000	846.3	1014.5	60	31	45.4	-----	74	24	13	4	0	18	19	39	.94	-----	.60	4	1	7.0	4	5.9	NNE	--	---	--	14	5	12	4.7	--	601
Phoenix CO	1083	------	------	75	48	61.4	+.7	87	24	33	4	0	0	--	--	.20	-.43	.13	2	1	0	0	7.0	---	25	N	28	--	--	--	---	89	129
Phoenix	1108	973.6	1012.8	76	45	60.7	-----	89	24	30	4	0	1	27	32	.44	-.24	.37	3	1	T	T	5.7	E	--	---	--	13	3	10	4.2	--	147
Prescott	5014	845.2	1014.7	60	29	44.2	-----	74	25	15	4	0	24	14	36	.46	-----	.31	3	1	4.9	4	9.7	SSW	32	SW	30	16	5	10	4.2	83	640
Tucson	2558	924.5	1012.8	72	43	57.4	-.3	91	21	26	4	0	3	21	28	.12	-.62	.06	3	0	0	0	7.0	SSE	34	S	30	12	6	13	4.9	83	230
Winslow	4880	849.6	1013.3	60	29	44.3	-1.7	73	15	15	4	0	19	11	31	.29	-.20	.16	3	1	1.3	T	11.4	SW	*47	WNW	27	16	3	7	4.0	--	634
Yuma	203	1008.5	1013.6	81	49	64.8	-----	91	24	32	4	3	1	23	26	T	-----	T	0	0	0	0	8.8	SSE	33	SW	2	20	4	7	3.1	95	74
ARKANSAS																																	
Fort Smith	458	993.3	1015.2	62	38	50.3	-2.3	82	22	25	13	0	3	35	62	1.40	-1.61	.58	6	4	T	T	11.6	ENE	31	SW	17	--	--	--	7.0	43	454
Little Rock	257	1002.4	1015.5	63	42	52.5	-.5	80	22	26	13	0	5	39	66	1.93	-2.64	1.03	9	2	.1	T	9.0	NW	30	E	*27	--	--	--	7.3	51	392
Texarkana	361	1002.0	1015.6	66	44	55.3	-.4	85	7	29	13	0	3	42	65	2.54	-2.32	1.03	10	4	T	0	12.1	S	--	---	--	4	9	13	7.3	--	306
CALIFORNIA																																	
Bakersfield	439	999.0	1017.2	72	44	57.6	+.9	85	15	32	3	0	1	35	47	.36	-.70	.36	2	1	T	0	5.1	NW	--	---	--	14	9	8	4.2	--	231
Beaumont CO	2589	924.3	1015.4	66	38	51.3	-----	79	25	23	4	0	5	26	47	.59	-----	.56	3	0	3.0	1	9.9	E	*34	E	12	14	9	8	4.5	--	406
Bishop	4108	872.0	1013.2	67	29	48.1	-----	80	28	14	3	0	21	--	--	T	-----	T	0	0	T	0	----	---	--	---	--	11	7	13	5.1	--	518
Blue Canyon	5280	837.8	1017.0	43	31	39.9	-----	65	14	14	2	0	15	22	57	6.32	-----	1.90	9	0	64.7	66	12.1	ENE	--	---	--	10	6	15	6.1	--	771
Burbank	699	989.2	1015.4	70	45	57.5	-----	86	14	33	4	0	0	38	54	.49	-----	.43	2	1	T	T	5.5	S	*23	NNE	5	16	7	8	4.4	--	229
Eureka CO	43	1018.6	1021.0	52	39	45.7	-2.6	67	13	30	10	0	2	--	--	3.94	-1.29	1.51	12	0	T	T	8.2	---	30	N	16	5	11	15	6.9	50	597
Fresno	331	1005.4	1017.4	68	39	53.6	-.8	83	23	27	3	0	5	41	67	.31	-1.27	.19	2	0	0	0	6.9	NW	25	NW	9	14	6	11	4.7	87	348
Los Angeles CO	312	------	------	71	50	60.2	+2.7	88	14	39	4	0	0	--	--	.44	-2.34	.39	3	1	T	T	6.1	---	23	SE	1	15	6	10	4.7	77	163
Los Angeles	99	1012.2	1015.9	67	47	56.9	-----	86	14	37	2	0	0	43	67	.38	-----	.33	3	1	T	T	5.3	W	--	---	--	14	9	8	4.5	--	251
Mt. Shasta CO	3543	893.0	1018.5	52	28	39.6	-1.2	71	24	14	3	0	26	24	57	1.00	-3.57	.34	10	0	6.0	2	9.8	NW	--	---	--	7	9	15	6.2	--	776
Oakland	3	1018.3	1018.4	64	42	53.2	+.8	82	27	33	10	0	0	38	61	1.46	-1.10	1.13	6	0	T	0	5.9	W	--	---	--	12	9	10	4.8	--	360
Red Bluff	311	1004.7	1017.6	66	42	54.1	+.5	81	14	29	3	0	2	30	45	.12	-3.13	.10	3	0	0	0	10.7	NNW	37	SE	6	11	9	11	5.1	77	332
Sacramento CO	25	------	------	--	--	----	-----	--	--	--	--	-	--	--	--	----	-----	----	--	-	----	--	----	---	--	---	--	--	--	--	----	--	326
Sacramento	17	1015.2	1017.6	66	41	53.3	-1.0	79	27	30	3	0	1	38	59	.66	-1.91	.26	4	0	0	0	12.5	NNW	33	SE	*4	15	6	10	4.5	76	357
Sandberg CO	4517	861.8	1015.3	55	37	45.7	-----	68	15	21	3	0	11	20	47	.32	-----	.26	2	0	5.4	5	20.0	NW	--	---	--	16	5	10	4.5	--	594
San Diego	19	1012.5	1015.7	68	50	58.7	+1.7	83	14	41	4	0	0	43	61	.50	-1.22	.49	3	1	T	T	6.4	S	35	SW	1	15	9	7	4.3	71	191
San Francisco CO	52	------	------	62	46	54.1	-.1	77	14	40	1	0	0	--	--	1.32	-1.82	.97	7	0	T	0	3.1	---	33	W	25	13	8	5	3.8	81	330
San Francisco	1	1017.6	1018.4	62	41	51.6	+.2	76	28	32	3	0	1	40	63	1.31	-1.59	.98	6	0	T	0	10.1	WNW	38	W	25	13	10	8	4.5	--	407
Santa Catalina	1563	959.0	1015.1	63	47	54.9	-----	80	14	36	2	0	0	--	--	.41	-----	.31	4	0	T	0	----	---	--	---	--	12	10	9	4.7	--	317
Santa Maria	231	1008.8	1017.4	67	39	53.1	-----	88	14	30	3	0	3	40	67	.13	-----	.10	2	0	0	0	7.9	W	*25	WNW	2	15	6	10	4.3	--	365
COLORADO																																	
Alamosa	7534	766.6	1014.8	48	15	31.2	-----	61	25	-4	29	0	31	--	--	.37	-----	.23	4	0	6.7	4	----	---	--	---	--	7	15	9	5.7	--	1038
Colorado Springs	6175	804.9	1015.6	47	19	33.2	-----	65	22	7	19	0	30	12	46	.36	-----	.23	6	0	3.5	2	12.8	N	--	---	--	9	11	11	5.1	--	979
Denver	5292	832.4	1013.6	50	22	35.8	-2.0	70	26	12	12	0	23	14	46	1.47	+.34	.37	10	0	17.6	5	8.6	S	41	NW	23	10	12	9	5.3	74	893
Grand Junction	4849	856.4	1013.8	53	28	41.0	-2.6	68	26	19	17	0	19	14	37	.25	-.51	.12	3	1	1.8	1	9.7	ESE	49	NW	16	6	14	11	5.9	76	739
Pueblo	4799	853.0	1014.0	54	22	38.0	-2.3	74	22	9	12	0	30	14	45	.44	-.15	.15	6	0	5.1	2	8.1	N	45	NW	4	10	10	11	5.3	55	830
CONNECTICUT																																	
Bridgeport	7	1016.6	1017.4	46	32	39.2	-----	59	31	22	10	0	16	30	71	5.16	-----	1.80	13	0	3.4	1	12.0	N	*35	ENE	14	7	8	16	6.8	--	793
Hartford	15	1011.2	1017.2	47	31	39.0	+4.0	64	23	20	27	0	20	30	73	6.08	+2.13	2.53	14	0	11.3	4	10.1	NNW	30	N	10	6	5	20	7.6	47	801
New Haven	6	1012.9	1016.9	46	32	39.2	+4.7	58	31	20	27	0	16	--	--	6.29	+2.50	2.39	15	0	8.1	3	9.7	---	39	SE	30	7	7	17	6.8	54	794
DELAWARE																																	
Wilmington	73	1013.5	1016.9	51	32	41.5	-----	66	23	22	27	0	17	31	68	3.76	-----	1.47	13	0	T	T	10.6	NW	--	---	--	7	8	16	6.6	--	713
FLORIDA																																	
Apalachicola	13	1016.3	------	69	56	62.4	+.8	73	7	39	14	0	0	--	--	4.13	-.11	2.31	8	4	0	0	10.0	---	50	SW	29	10	11	10	5.3	70	127
Daytona Beach	35	1016.9	1018.3	75	54	64.5	-.1	85	29	39	14	0	0	56	79	1.13	-1.90	.50	5	2	0	0	11.9	S	*25	ESE	13	12	11	8	4.5	--	105
Fort Myers	15	1017.6	1018.1	81	56	68.2	-.7	86	6	48	16	0	0	58	75	1.13	-.76	1.11	3	3	0	0	8.3	SW	--	---	--	16	7	8	4.4	--	15
Jacksonville CO	----	------	------	--	--	----	-----	--	--	--	--	-	--	--	--	----	-----	----	--	-	----	--	----	---	--	---	--	--	--	--	----	--	95
Jacksonville	13	1017.3	1018.2	74	53	63.4	+1.9	86	8	36	14	0	0	50	63	2.28	-.63	.35	8	1	0	0	8.1	NE	30	W	19	9	12	10	5.6	65	121
Key West CO	5	1016.6	1017.1	80	68	74.2	+1.6	83	19	61	15	0	0	--	--	.24	-1.15	.16	2	2	0	0	9.0	---	30	NW	21	13	14	4	4.2	70	0
Key West	6	1016.9	1017.4	79	68	73.4	+1.8	82	20	60	22	0	0	63	73	.27	-1.12	.13	3	2	0	0	12.6	ESE	--	---	--	19	8	4	3.9	--	0
Lakeland CO	214	------	------	76	57	66.7	-.9	85	9	43	14	0	0	--	--	3.00	-.28	2.49	6	2	0	0	----	---	--	---	--	10	13	8	5.0	--	56
Melbourne	22	1017.3	1018.3	76	56	66.3	+.5	87	19	45	22	0	0	57	77	1.05	-1.94	.39	6	1	0	0	10.3	SE	*23	SE	18	9	13	9	5.3	--	63
Miami Beach	----	------	------	76	66	71.4	-----	90	8	52	22	0	0	--	--	1.17	-----	.92	5	--	0	0	----	---	--	---	--	20	7	4	----	--	1
Miami CO	9	------	------	75	65	69.7	-.6	79	6	43	22	0	0	--	--	.90	-1.73	.39	4	1	0	0	14.2	---	40	NW	13	13	12	6	4.5	64	8
Miami	9	1016.9	1017.7	79	62	70.5	-----	85	9	47	22	0	0	59	70	.47	-----	.28	3	1	0	0	9.4	SE	*27	SSE	19	17	7	7	4.6	--	4
Orlando	111	1013.9	1018.3	78	55	66.1	-.9	87	29	42	14	0	0	54	72	.96	-2.11	.56	6	0	0	0	11.5	SSE	*30	S	19	12	11	8	4.9	--	70
Pensacola	13	1014.9	1017.1	69	55	62.1	+1.8	85	8	34	13	0	0	52	--	8.45	+3.63	7.22	8	4	0	0	10.6	SSE	28	NW	29	10	7	14	5.9	65	157
Tallahassee	64	1015.9	1018.1	74	51	62.1	-----	88	9	32	14	0	1	49	69	7.43	-----	4.25	10	6	0	0	7.8	SSE	--	---	--	9	10	12	5.7	--	151
Tampa	24	1016.9	1018.1	77	58	67.3	+.5	82	6	45	14	0	0	56	72	1.99	-.44	1.47	6	2	0	0	8.7	E	34	W	12	11	13	7	4.9	64	42
West Palm Beach	14	1016.9	1017.8	80	60	69.5	.0	85	20	48	17	0	0	60	76	.70	-2.68	.29	5	0	0	0	9.8	SSE	--	---	--	9	14	8	5.3	--	21
GEORGIA																																	
Albany	190	1010.8	1018.0	72	49	60.3	+.1	85	8	33	14	0	0	46	66	5.19	+.01	2.19	10	2	T	T	7.0	W	35	W	13	10	8	13	5.8	--	182
Atlanta CO	----	------	------	60	43	51.8	-.2	80	2	26	14	0	4	--	--	4.37	-.93	1.31	--	--	----	--	----	---	--	---	--	--	--	--	----	--	410
Atlanta	977	975.3	1016.9	62	44	53.1	+1.1	81	2	28	14	0	4	41	69	4.60	-.31	1.53	13	2	T	T	10.2	WNW	37	NW	21	6	7	18	7.0	52	373
Athens	798	987.3	------	62	43	52.3	-----	82	2	28	14	0	4	--	--	4.32	-----	1.38	13	0	T	0	----	---	--	---	--	--	--	--	6.9	--	391
Augusta	426	1010.3	1017.3	66	45	55.7	-.3	86	2	31	14	0	1	43	68	5.35	+1.33	1.60	11	1	0	0	8.2	SE	25	W	30	6	10	15	6.6	--	291
Columbus	382	1003.1	1017.3	67	45	56.1	-----	82	8	29	16	0	3	45	69	3.72	-----	1.42	10	2	T	0	10.0	W	--	---	--	6	7	13	7.0	--	283
Macon	354	1005.1	1016.9	68	47	57.5	-----	85	2	31	14	0	1	44	65	2.99	-----	.92	10	1	T	0	11.5	WNW	35	SE	13	7	6	13	6.9	57	254
Rome	637	993.9	1017.4	63	41	52.0	-----	83	2	26	22	0	8	43	77	12.31	-----	7.53	13	0	T	T	8.9	---	--	---	--	6	8	17	7.2	--	399
Savannah	38	1015.6	1017.9	69	49	58.9	+1.8	86	2	32	14	0	1	43	74	4.53	+1.52	2.34	12	3	0	0	9.3	W	34	NE	6	5	13	13	6.4	43	225
Valdosta	200	1009.5	1017.7	73	49	60.9	-.8	85	2	31	14	0	2	46	--	9.25	+5.63	3.35	10	6	0	0	9.4	SW	--	---	--	9	11	11	5.5	--	165
IDAHO																																	
Boise	2842	919.7	1017.6	47	27	37.1	-4.3	63	20	16	10	0	23	25	63	1.05	-.30	.28	11	3	11.9	3	13.2	SE	50	W	29	3	11	17	7.4	59	860
Lewiston	1413	965.1	1017.9	49	30	39.7	-----	64	25	20	5	0	18	27	62	.66	-----	.35	7	0	3.9	3	6.4	W	--	---	--	2	7	22	8.1	--	776
Pocatello	4444	861.2	1017.3	43	23	33.1	-2.8	63	21	10	1	0	28	21	65	.33	-.90	.13	8	1	5.2	5	9.3	SW	52	SW	15	7	5	19	6.9	55	980
ILLINOIS																																	
Cairo CO	314	1002.4	1015.6	56	39	47.2	-.5	75	6	27	21	0	8	--	--	2.90	-.85	1.42	15	3	1.9	1	11.1	---	57	SW	29	--	--	--	7.1	46	549
Chicago	618	992.6	1014.8	43	27	35.3	+.8	69	6	12	21	0	24	25	71	2.81	+.25	.81	13	2	4.9	2	13.0	W	38	W	3	8	5	18	6.7	50	915
Joliet	580	992.9	1014.8	44	26	34.8	-1.4	68	6	11	21	0	27	27	79	2.66	+.01	.59	14	3	6.1	T	13.6	WSW	--	---	--	11	3	17	6.5	--	931
Moline	539	992.2	1015.9	40	24	31.3	-3.0	63	6	6	21	0	27	24	75	5.06	+2.75	1.79	14	4	17.0	14	14.1	W	47	W	13	10	5	16	6.3	46	1020
Peoria	659	992.2	1015.2	43	26	34.7	-3.6	69	6	11	21	0	27	27	76	3.35	+.62	.64	13	4	10.2	6	14.2	W	45	SW	3	11	2	18	6.6	50	931
Springfield CO	----	------	------	--	--	----	-----	--	--	--	--	-	--	--	--	----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	----	--	841
Springfield	598	991.2	1015.0	45	28	36.5	-1.7	73	23	13	16	0	25	29	73	3.86	+.69	1.31	13	3	7.4	3	17.0	W	52	W	23	--	--	--	6.6	46	876

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

MARCH 1951

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F	°F	°F		°F.				°F	%	In.	In.	In.			In	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	1000.0	1015.8	51	34	42.2	-2.2	75	6	23	21	0	17	35	77	6.21	+2.02	2.95	17	5	4.2	2	12.3	WNW	43	NW	23	--	--	--	7.4	41	700
Fort Wayne	801	983.4	1015.5	45	28	36.6	+.5	70	6	14	21	0	26	29	78	3.31	+.09	.83	15	3	3.3	1	11.4	W	36	SW	24	2	11	18	7.3	46	874
Indianapolis CO	----	------	------	--	--	----	-----	--	-	---	--	-	--	--	--	----	-----	----	--	--	----	-	----	---	--	--	--	--	--	--	---	--	796
Indianapolis	796	985.4	1015.8	47	29	37.8	-1.0	70	6	13	21	0	24	30	79	3.16	-.77	.96	16	2	7.0	3	13.8	W	49	SW	30	--	--	--	7.4	41	837
South Bend	768	985.3	1014.6	44	27	35.1	-1.0	69	6	11	21	0	26	27	75	1.98	-.97	.60	12	2	3.5	1	15.5	WSW	*45	SW	23	5	7	19	7.5	--	913
Terre Haute	535	994.2	1015.9	47	30	38.5	-2.1	70	6	13	21	0	23	30	75	2.62	-1.14	.56	18	3	7.4	3	12.2	WNW	43	W	3	--	-	--	7.1	43	814
IOWA																																	
Burlington	605	988.3	1015.2	41	23	31.9	-6.0	70	6	2	16	0	27	25	79	5.24	+2.50	1.91	17	2	13.2	16	13.2	W	36	NW	23	6	8	17	8.0	48	1019
Charles City	1013	978.0	1016.3	31	16	23.5	-7.2	47	27	-5	16	0	29	--	--	4.57	+2.80	1.11	13	2	32.6	18	8.3	---	22	W	°3	11	4	16	6.3	41	1232
Davenport CO	579	992.6	------	40	24	32.2	3.9	63	6	7	21	0	27	--	--	6.09	+3.78	1.75	14	3	23.1	15	----	---	--	---	--	--	--	--	-	-	1011
Des Moines	300	934.4	1016.6	37	20	28.6	7.3	64	5	1	16	0	29	21	77	3.96	+2.08	1.12	13	1	16.7	13	15.9	N	17	W	3	--	-	-	7.1	39	1122
Dubuque	641	975.3	1014.3	35	19	27.1	-----	53	6	2	21	0	23	22	82	4.17	----	.95	13	3	23.0	16	14.2	N	39	SW	13	--	--	--	7.2	--	1168
Sioux City	1097	974.6	1017.6	35	17	26.2	-5.9	69	26	-2	8	0	29	19	77	2.38	+1.23	.53	10	1	17.5	11	13.5	NW	37	NW	6	3	9	19	7.9	54	1197
KANSAS																																	
Concordia CO	1375	965.5	1016.6	46	26	35.9	-5.1	77	22	10	3	0	25	-	--	1.78	+.55	.63	7	1	6.3	5	10.9	---	35	NW	25	--	--	-	5.7	53	893
Dodge City	2594	925.5	1014.9	52	25	38.7	-1.1	83	22	12	13	0	25	20	57	.90	+.01	.67	6	0	4.5	2	16.2	N	60	NE	23	14	7	10	5.0	73	803
Goodland	3645	885.5	1015.1	50	17	33.4	-6.3	79	22	0	13	0	29	17	57	.13	-.81	.10	6	0	4.1	2	13.5	N	*43	NNW	23	12	8	11	5.2	--	961
Topeka CO	----	------	------	-	--	----	-----	--	--	---	--	-	--	--	--	----	-----	----	--	--	----	--	----	---	--	---	--	--	--	-	---	--	827
Topeka	926	983.1	1016.0	49	26	37.8	----	76	22	16	21	0	23	27	70	1.80	----	.55	7	3	.5	T	13.4	NW	40	NW	23	-	-	--	6.5	45	835
Wichita	1372	965.5	1014.8	51	29	39.9	-5.2	77	22	15	12	0	22	26	65	2.69	+.94	1.37	6	2	T	T	17.0	NNW	50	NW	23			--	6.0	67	772
KENTUCKY																																	
Lexington	979	976.6	1016.5	51	32	41.9	-1.8	72	29	20	20	0	13	34	75	1.96	+.64	1.30	23	5	9.6	3	13.2	SSW	--	---	-	5	8	18	7.5	--	711
Louisville CO	----	------	------	--	--	----	-----	--	-	---	--	-	--	--	--	----	-----	----	--	--	----	--	----	---	--	---	--	--	-	-	---	-	669
Louisville	485	999.3	1016.0	52	34	43.0	-1.1	71	3	21	26	0	16	34	73	5.75	+1.36	1.63	20	4	10.7	1	10.5	S	43	SW	23	4	8	19	7.5	37	674
LOUISIANA																																	
Baton Rouge	64	1015.2	1016.3	71	52	61.4	-.1	83	8	33	13	0	0	51	76	6.00	+1.06	2.05	8	4	.0	0	8.5	S	--	---	--	--	-	--	6.8	--	198
Lake Charles	12	1014.6	1015.3	72	52	61.3	+.9	84	7	32	13	0	2	52	79	7.75	+3.92	4.75	9	4	.0	0	12.0	S	--	---	--	-	--	--	6.6	--	170
New Orleans CO	12	1014.6	-- -	73	56	64.2	+1.4	83	3	35	13	0	0	--	--	9.68	+3.96	5.00	8	4	.0	0	7.4	---	21	NW	°12	--	-	--	5.6	40	130
New Orleans	12	1014.6	1016.5	72	53	62.5	-----	83	11	33	13	0	0	58	77	7.74	---	3.98	9	4	T	0	10.2	S	--	---	--	-	-	--	6.2	--	159
Shreveport	174	1006.4	1015.4	69	47	57.9	-.5	85	7	29	13	0	3	47	71	3.28	-.33	1.13	10	5	T	0	12.0	S	42	W	28	-	-	-	7.3	43	246
MAINE																																	
Caribou	624	994.6	1019.0	33	17	25.0	+3.2	50	29	-9	1	0	30	18	74	1.51	-.84	.46	13	0	9.4	22	10.5	N	*40	W	20	6	8	17	7.5	--	1233
Eastport	53	1014.6	1017.6	38	27	32.9	+4.0	47	29	9	1	0	25	--	--	2.69	-1.14	.59	14	0	8.6	7	13.0	---	49	E	15	4	8	19	7.5	43	990
Portland	61	1013.2	1016.3	40	26	33.2	+2.1	52	29	10	1	0	25	27	79	9.19	+5.33	3.47	14	0	10.9	6	10.8	N	36	E	14	4	9	18	7.5	49	976
MARYLAND																																	
Baltimore CO	14	------	------	53	37	45.1	+2.8	70	23	27	10	0	5	--	--	3.21	-.50	1.41	11	0	----	--	----	---	--	---	--	--	--	--	---	--	611
Baltimore	146	1012.9	1017.4	53	34	43.3	-----	70	23	24	11	0	14	31	65	3.70	-----	1.41	13	0	T	T	13.0	NW	72	E	14	8	9	14	6.4	45	665
Frederick	294	------	-- ---	54	32	42.9	-----	69	9	12	10	0	17	--	--	2.95	-- -	.93	11	0	T	--	----	---	--	---	--	--	--	--	--	--	678
MASSACHUSETTS																																	
Boston	12	1012.2	1016.3	45	33	39.1	+3.3	65	7	21	3	0	10	29	70	4.41	+.84	1.03	13	0	3.9	2	13.7	SW	34	E	14	4	4	23	7.9	41	797
Nantucket	13	1015.6	1016.0	41	33	33.6	+3.1	55	21	24	10	0	11	32	79	3.69	-.06	.39	15	0	1.7	T	14.8	N	49	SSE	20	5	6	20	7.3	59	868
Pittsfield	1153	------	------	40	25	32.3	+2.4	61	28	13	10	0	29		--	4.74	+1.31	1.32	13	0	10.5	5	10.4	---	--	---	-	2	8	21	7.9	--	1005
MICHIGAN																																	
Alpena CO	587	991.9	1014.9	35	23	29.1	+3.6	53	27	6	26	0	26	--	--	2.72	+.73	1.04	12	1	19.5	10	12.8	---	57	SE	1	5	6	20	7.4	43	1107
Detroit	619	987.3	1015.6	44	29	36.5	+3.5	67	6	17	22	0	22	27	76	2.59	+.19	.65	13	2	6.5	5	11.1	NW	43	NW	24	--	--	--	7.5	42	878
Escanaba CO	594	991.5	1014.6	33	20	26.5	+2.3	44	27	3	21	0	26	--	--	3.11	+1.22	1.17	13	0	10.0	18	12.7	---	43	N	23	--	--	--	7.0	57	1189
Grand Rapids CO	683	------	------	--	--	----	-----	--	-	---	--	-	--	--	--	----	------	----	--	--	----	--	----	---	--	---	--	--	-	-	---	--	913
Grand Rapids	683	983.3	1014.8	42	26	33.9	+3.2	62	6	12	22	0	24	25	77	2.02	-.46	.47	16	3	11.0	3	13.3	E	38	W	3	--			8.1	38	957
Lansing	859	982.1	1015.1	41	26	33.7	+2.1	64	6	15	21	0	25	25	79	1.67	-.63	.44	12	2	4.3	2	13.0	N	52	NW	24	-			7.5	36	960
Marquette CO	677	986.3	1013.5	31	20	25.7	+.9	53	27	7	21	0	27	--	--	2.34	+.08	.72	12	0	14.1	25	8.5	---	31	SW	19	-			8.2	44	1213
Muskegon	627	990.9	1014.6	40	26	32.9	+.6	59	29	9	25	0	24	24	75	2.30	+.18	.59	15	2	6.1	4	13.0	W	*37	WSW	19	3	4	24	8.5	--	938
Sault Ste. Marie	721	991.5	1015.2	33	19	25.3	+5.2	46	27	1	26	0	28	19	73	2.60	+.95	.71	14	0	17.5	22	10.9	E	38	SW	3				8.3	35	1207
Ypsilanti	722	985.8	1015.1	44	28	36.0	----	67	6	16	20	0	25	26	74	3.13	-----	.93	13	2	5.4	1	13.4	WSW	*38	WSW	24	6	4	21	7.5	--	896
MINNESOTA																																	
Duluth CO	1128	-----	--- --	--	--	----	--- -	--	--	---	--	-	--	-	-	----	-----	----	--	--	----	--	----	---	--	--	-	--	--		--	--	1401
Duluth	1128	962.1	1016.3	27	10	18.1	-----	45	23	-11	9	0	31	12	76	2.30	-----	.78	13	0	21.8	33	13.7	WNW	35	NE	3		--	--	7.7	50	1446
Intern'l Falls	1179	972.6	1017.3	27	5	15.9	-6.0	46	27	17	9	0	31	10	78	3.02	+2.01	.97	14	0	33.1	25	----	---	--	---	-	7	6	18	7.1	--	1517
Minneapolis	830	981.4	1016.6	29	13	21.1	-8.5	46	27	-10	9	0	29	15	77	3.00	+1.58	.74	16	0	40.0	27	12.3	WNW	17	E	3	--	--	-	7.1	45	1353
Rochester	1014	977.7	1016.5	30	12	21.3	-3.1	47	27	6	16	0	28	15	77	4.01	+2.53	.94	17	1	35.1	20	12.5	NNW		-		5	7	19	7.5	-	1343
St. Cloud	1034	977.7	1017.3	28	8	18.1	-9.6	41	26	-18	9	0	31	12	79	2.41	+1.16	.82	16	0	28.1	27	9.9	WNW	--	--	--	5	6	20	7.5	--	1450
St. Paul	703	989.2	1016.8	30	13	22.0	-8.0	45	27	-3	9	0	30	15	75	3.30	+1.87	1.00	17	0	38.3	22	12.1	NW	34	NE	2	6	3	22	7.4	--	1342
MISSISSIPPI																																	
Jackson	315	1004.4	1016.3	69	48	58.8	+.3	83	10	28	13	0	4	46	63	5.54	+.06	1.88	10	6	T	0	10.5	S	36	SE	27	6	5	20	7.0	44	242
Meridian	294	1008.1	1016.6	70	47	58.3	+2.5	85	10	29	14	0	6	47	72	10.41	+5.18	4.87	10	4	T	0	8.4	SSW	--		--	6	6	19	7.0	--	249
Vicksburg	234	1003.1	------	68	50	59.0	+.5	83	10	23	13	0	2	--	--	12.75	+7.18	9.97	10	3	T	0	10.5	---	31	S	17	5	10	16	7.1	50	226
MISSOURI																																	
Columbia	733	985.8	1014.9	49	28	38.6	-2.6	76	6	15	21	0	23	30	75	4.02	+1.08	1.07	13	6	2.1	1	14.3	NW	51	NW	23	--	--	--	6.6	50	812
Kansas City	741	979.3	1015.4	49	29	38.8	-3.9	75	22	15	9	0	21	28	69	2.33	+.02	.84	9	4	.2	T	11.6	NW	42	S	23	--	--	--	6.6	53	803
St. Joseph	809	979.7	1015.7	46	26	35.9	-4.6	75	26	7	21	0	24	26	73	3.26	+.78	1.08	11	2	4.5	3	14.5	NW	35	S	5	7	10	14	6.4	46	893
St. Louis CO	465	------	------	49	32	40.9	-3.2	75	23	18	21	0	16	--	--	2.54	-.84	.78	14	2	6.5	4	13.4	---	40	SW	23	--	-	--	6.7	54	741
St. Louis	465	993.9	1014.3	49	31	40.1	-2.9	74	23	17	21	0	24	31	75	2.75	-.13	.68	13	1	7.1	4	11.4	WNW	--	---	--	--	-	--	6.9	--	765
Springfield	1265	966.1	1014.5	54	31	42.6	-1.0	76	22	14	21	0	13	31	70	2.91	-.49	1.56	10	3	.9	1	17.2	NW	50	NW	23	7	6	18	7.0	53	687
MONTANA																																	
Billings	3568	889.9	1018.5	33	13	22.5	-11.5	61	25	-19	6	0	29	14	70	1.01	-----	.22	10	0	14.5	9	10.3	NNE	56	NW	15	8	6	17	6.4	61	1313
Butte	5530	825.3	1019.0	35	6	20.5	-7.3	51	29	-25	3	0	31	12	63	1.01	+.37	.24	12	0	13.5	14	9.4	NW	--	---	--	3	4	24	8.3	-	1373
Glasgow CO	2090	942.3	1021.7	24	2	12.7	-12.9	51	26	-29	6	0	31	6	71	.54	-.24	.25	7	0	4.3	11	----	---	--	---	--	10	6	15	6.2	--	1617
Great Falls	3664	887.2	1019.3	28	10	19.1	-15.2	59	29	-29	8	0	27	9	66	1.22	+.36	.44	11	1	14.8	15	12.2	SW	73	W	15	3	7	21	7.2	54	1422
Havre CO	2488	927.5	1021.0	28	6	16.6	-10.5	58	29	-30	8	0	30	--	--	.54	+.03	.23	9	0	6.9	5	9.0	---	35	SW	15	5	8	18	7.0	60	1498
Helena	3893	872.0	1019.9	32	11	21.1	-10.6	59	25	-26	8	0	27	12	67	.84	+.05	.23	12	1	11.4	7	6.7	W	44	W	15	2	5	24	8.2	59	1356
Kalispell	2965	910.3	1016.7	37	18	27.6	-----	59	31	-8	5	0	30	17	68	.44	-----	.13	12	0	6.2	4	11.3	NNE	--	---	--	1	5	25	8.5	--	1155
Miles City	2629	932.6	1020.3	32	8	20.4	-- --	62	25	-25	8	0	30	13	--	.15	-----	.05	5	0	1.9	3	10.3	WNW	--	---	--	9	7	15	6.1	--	1380
Missoula	3201	900.8	1017.9	39	21	29.8	-3.7	58	25	-6	8	0	28	20	67	.92	+.10	.32	10	0	8.5	7	6.1	WNW	47	NW	15	1	4	26	8.9	30	1086
NEBRASKA																																	
Grand Island	1841	948.2	1016.4	42	21	31.3	-----	77	22	2	8	0	28	20	69	1.79	-----	.96	8	1	2.4	2	16.3	NNW	--	---	--	11	10	10	5.7	--	1039
Lincoln CO	1184	972.9	------	42	24	32.9	-4.7	77	26	6	8	0	26	--	--	2.21	+.94	.77	9	1	3.9	3	12.4	---	39	NW	23	--	--	--	——	55	991
Lincoln	1180	972.9	1017.0	41	22	31.6	-4.9	75	26	5	8	0	27	22	73	2.63	+1.36	1.28	8	1	4.7	2	13.4	NNW	--	---	--	--	--	--	6.5	-	1028
Norfolk	1554	960.4	1018.0	35	17	26.3	-9.1	75	26	-4	21	0	29	20	79	2.29	+.97	.66	7	1	13.2	6	18.2	NNW	--	---	--	--	--	--	6.7	--	1195
North Platte	2733	914.3	1015.9	45	18	31.6	-5.0	76	26	3	8	0	30	17	62	.23	-.63	.13	4	1	.7	T	12.9	N	59	N	28	3	11	12	5.8	63	1028
Omaha	978	975.6	1016.8	39	22	30.7	-5.4	75	26	5	8	0	26	23	76	3.18	+1.81	1.26	11	1	9.3	4	15.5	NNW	42	E	2	--	--	--	6.8	51	1055
Scottsbluff	3950	876.7	1016.1	46	17	31.7	-4.7	72	26	2	8	0	30	13	52	.25	-.62	.11	5	0	5.1	2	10.2	NW	--	---	--	8	13	10	5.9	--	1024
Valentine CO	2591	923.1	1018.6	37	13	25.0	-7.3	73	26	-7	8	0	29	--	--	.39	-.63	.31	5	0	5.8	5	10.6	---	38	SW	16	7	13	11	5.9	72	1236

See footnotes at end of table.

Table 2–Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
NEVADA																																	
Elko	5075	843.6	1017.0	48	21	34.4	-----	65	25	10	3	0	31	22	65	0.42	-----	.17	5	0	11.9	6	7.3	SW	—	----	--	10	8	13	5.7	--	939
Ely	6257	806.3	1016.3	47	17	32.3	-.2	63	25	3	2	0	31	--	--	.20	-.99	.16	3	0	1.4	1	13.0	---	59	SE	4	12	6	13	5.5	67	1008
Las Vegas	2162	937.0	1013.1	68	41	54.6	+.9	82	25	27	1	0	5	10	21	.03	-.31	.03	1	0	T	0	8.4	SW	--	----	--	16	5	10	4.3	85	319
Reno	4397	861.2	1016.4	55	22	38.4	-1.6	71	20	5	3	0	29	20	49	.24	-.57	.15	2	0	2.5	2	6.7	S	68	S	5	14	6	11	5.0	78	818
Winnemucca	4299	867.3	1017.6	51	21	35.9	-4.1	68	20	3	3	0	29	19	52	.34	-.62	.16	8	0	5.2	2	9.0	---	49	W	4	10	5	16	6.2	53	894
NEW HAMPSHIRE																																	
Concord	339	1006.1	1017.2	42	25	33.5	+4.4	65	28	7	23	0	25	25	72	4.29	+1.26	1.15	17	0	8.0	4	6.9	NW	33	NE	14	3	5	23	7.9	43	971
Mt. Washington	6262	793.5	1018.0	20	8	14.0	+2.5	35	29	-9	10	0	31	--	95	4.49	-2.71	1.53	23	0	36.9	23	35.4	W	°111	SSE	31	2	6	23	8.4	26	1566
NEW JERSEY																																	
Atlantic City CO	8	1014.9	1016.9	48	37	42.3	+3.7	59	31	24	10	0	8	—	--	3.29	-.31	1.18	13	1	T	T	18.6	---	65	S	30	7	8	16	6.4	59	693
Newark	11	1015.9	1017.0	49	34	41.7	+2.1	65	23	24	10	0	10	29	63	5.83	+1.93	2.40	11	0	.8	1	13.2	NNW	•37	E	14	6	11	14	6.1	--	717
Trenton CO	56	1009.3	1016.9	49	34	41.7	+2.6	63	7	24	10	0	11	—	--	3.92	+.52	1.17	13	0	.2	T	11.4	---	35	NW	10	7	9	15	6.5	61	715
NEW MEXICO																																	
Albuquerque	5310	845.6	1011.6	59	33	46.3	+.4	71	21	13	4	0	15	13	32	.29	-.16	.26	3	3	T	T	10.4	SE	40	W	2	12	9	10	5.0	68	572
Clayton	4969	843.9	1012.9	56	23	39.4	-3.2	76	7	6	19	0	26	19	51	.49	-.20	.26	5	0	3.7	2	17.9	W	--	---	--	10	11	10	5.5	--	787
Raton	6379	800.5	1012.3	52	19	35.5	-----	63	7	-3	19	0	29	13	44	.87	-----	.36	6	1	10.7	4	11.6	W	--	---	--	11	9	12	5.5	--	905
Roswell	3611	880.9	1012.6	66	33	49.7	-1.6	80	21	13	13	0	16	17	35	.33	-.41	.13	6	1	T	0	10.8	W	47	NW	20	9	11	11	5.8	67	466
NEW YORK																																	
Albany	277	1013.2	1016.7	43	28	35.3	+5.5	64	23	17	27	0	23	26	72	4.30	+1.68	1.31	21	0	10.4	4	10.5	WNW	33	W	31	4	4	23	7.9	45	916
Bear Mountain	1300	------	------	42	29	35 4	-----	60	28	16	10	0	23	--	--	3.40	-----	5.50	12	0	7.4	3	----	---	--	---	—	7	10	14	6.4	--	911
Binghamton CO	853	------	------	43	28	35.5	+2.9	59	30	13	22	0	24	--	--	3.33	+.71	.78	18	1	11.9	4	7.3	---	29	SW	24	0	9	22	8.3	38	908
Binghamton	828	985.1	1016.9	43	27	34.9	-----	59	30	13	22	0	24	27	76	3.11	-----	.71	16	1	12.0	3	7.4	WSW	--	----	--	0	9	22	8.2	--	923
Buffalo	693	987.9	1016.4	42	29	35.3	+4.0	65	30	13	26	0	24	27	75	4.57	+2.00	.93	17	3	7.9	3	15.6	SW	66	SW	24	1	11	19	8.2	39	917
New York CO	10	1004.4	------	48	35	41.5	+3.9	61	28	23	10	0	10	--	--	5.13	+1.49	1.72	11	0	.3	T	17.2	---	65	E	30	9	10	13	6.0	58	721
New York	19	1015.2	1016.9	49	36	42.3	-----	62	24	24	10	0	8	30	66	6.93	-----	2.73	13	0	1.5	1	16.6	NW	46	NW	20	7	9	15	6.4	—	703
Oswego	292	1002.7	1015.9	41	30	35.2	+4.1	59	28	20	26	0	22	--	--	3.95	+1.37	.96	18	4	9.6	3	11.6	---	31	SW	24	4	9	13	7.6	35	916
Rochester	543	996.3	1016.0	42	28	35.4	+3.6	67	30	14	26	0	24	28	76	5.03	+2.27	1.30	18	4	8.3	2	12.9	WSW	56	SW	24	2	9	20	8.0	25	908
Syracuse	399	993.9	1016.6	42	28	35.1	+5.4	63	28	16	26	0	25	28	74	4.64	+1.33	1.31	21	3	12.2	3	11.3	WNW	42	W	30	3	6	22	7.9	37	921
NORTH CAROLINA																																	
Asheville CO	2203	------	------	57	33	47.4	+2.5	72	3	23	14	0	9	--	--	5.22	+1.25	1.31	17	1	.3	T	9.9	---	33	SE	29	6	9	16	6.7	52	538
Asheville	2093	942.1	1016.8	--	--	----	-----	--	—	---	--	-	--	36	72	----	-----	----	--	-	-----	—	8.4	NNW	--	---	--	--	--	--	---	—	---
Charlotte CO	741	988.5	------	61	43	52.1	+1.7	78	8	29	15	0	3	—	--	4.93	+.76	1.40	11	0	T	T	8.0	---	27	W	24	5	8	18	7.1	52	395
Charlotte	753	989.2	1017.0	62	41	51.4	+2.8	80	8	27	17	0	6	38	64	4.91	+.74	1.37	10	1	T	0	9.1	SW	--	----	--	5	8	13	7.1	--	415
Greensboro	891	985.1	1017.6	59	37	48.0	+.9	73	7	24	17	0	13	36	69	2.99	-1.37	1.29	10	0	T	T	9.3	NE	32	SW	30	7	10	14	6.5	48	519
Hatteras	4	1016.9	1017.5	57	46	51.4	-.6	69	29	36	10	0	0	44	76	3.99	-.26	1.00	8	0	.0	0	13.7	NNE	34	SW	14	8	8	15	6.1	57	416
Raleigh CO	400	------	------	61	40	50.8	+.6	75	7	29	15	0	5	--	--	2.66	-1.21	1.07	9	1	T	0	7.1	---	30	SW	30	8	12	11	5.7	52	436
Raleigh	438	1001.4	1017.3	61	38	49.4	-----	76	7	25	11	0	11	36	64	2.47	-----	.97	10	2	T	0	8.9	SW	--	----	--	7	12	12	6.0	—	478
Wilmington CO	6	1016.3	1017.7	63	47	55.1	+1.9	76	8	34	15	0	0	--	--	3.62	+.45	.94	7	0	.0	0	10.1	---	49	W	30	9	8	15	6.1	50	310
Wilmington	30	------	1017.7	--	--	----	-----	--	—	---	--	-	—	45	--	----	-----	----	--	-	-----	--	7.6	SW	--	---	--	--	--	--	---	—	---
Winston-Salem	967	991.7	1017.2	58	39	48.5	-.5	74	8	28	22	0	6	33	59	4.42	+.22	1.43	12	0	T	T	12.1	WNW	--	---	--	3	9	14	6.5	--	503
NORTH DAKOTA																																	
Bismarck	1653	957.3	1021.3	22	-1	10.7	-11.2	47	26	-25	9	0	31	6	81	.28	-.61	.14	8	0	3.8	14	11.3	NW	57	W	5	7	6	13	6.7	65	1630
Devils Lake CO	1471	963.4	1020.3	21	3	12.0	-7.8	45	27	-20	9	0	31	--	--	.54	-.24	.22	10	0	6.8	12	10.5	---	30	W	5	--	--	--	7.4	54	1641
Fargo	895	982.1	1019.6	24	7	15.3	-6.9	43	27	-19	9	0	31	11	80	.35	-.16	.33	14	0	11.5	15	16.0	NNW	42	W	5	--	--	--	7.6	52	1523
Williston CO	1377	949.5	1021.1	21	1	10.8	-12.1	47	26	-24	12	0	31	4	73	.26	-.43	.08	6	0	2.6	15	8.2	---	42	W	5	--	--	--	6.4	67	1630
OHIO																																	
Akron-Canton	1210	970.5	1016.1	46	28	36.5	+.1	68	6	12	20	0	24	28	75	5.11	+2.10	1.23	15	5	14.8	8	10.9	W	--	----	--	6	6	19	7.4	--	877
Cincinnati CO	553	992.6	------	51	35	43.2	+.4	72	6	25	22	0	14	--	--	4.19	+.30	.77	17	2	6.3	3	12.9	---	52	NW	23	--	--	--	---	35	665
Cincinnati	871	983.4	1015.8	49	32	40.1	-----	68	6	18	20	0	17	31	71	4.23	-----	.79	19	3	11.5	3	11.3	W	--	----	--	6	5	20	7.3	—	763
Cleveland CO	----	------	------	--	--	----	-----	--	--	---	--	-	--	--	--	----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--	832
Cleveland	787	937.5	1015.6	47	30	38.1	+3.6	69	6	17	20	0	21	29	74	4.90	+2.09	.86	14	3	14.5	5	13.7	W	54	W	24	5	3	13	7.4	39	828
Columbus CO	724	------	------	49	33	41.0	+1.9	69	29	20	19	0	16	--	--	3.92	+.42	1.17	15	3	3.4	4	11.2	---	44	SW	29	6	8	17	7.0	52	734
Columbus	815	985.4	1016.1	49	30	39.9	+2.3	70	6	15	20	0	21	30	71	4.86	+1.05	1.06	15	5	4.9	3	10.4	SW	•30	WSW	23	6	7	13	7.2	--	773
Dayton	1002	978.7	1015.7	47	30	38.5	-.2	67	6	14	22	0	21	30	74	3.17	-.52	.84	14	4	8.5	4	14.2	WNW	50	W	23	6	6	19	7.1	53	816
Sandusky	603	992.2	------	46	32	38.7	+3.6	71	6	17	22	0	17	—	--	3.42	+.71	.75	15	5	7.5	7	10.6	---	35	SW	24	4	12	15	6.9	51	811
Toledo	621	991.5	1015.2	45	28	36.5	+2.7	68	6	12	22	0	23	28	75	2.93	+.33	.60	14	4	8.8	6	13.9	SW	52	SW	3	3	6	22	7.5	36	877
Youngstown	1173	967.2	1016.0	45	27	36.1	-.9	67	29	15	20	0	24	27	74	5.68	+2.98	.98	18	3	19.9	7	11.6	W	•45	WSW	24	4	3	19	7.4	--	889
OKLAHOMA																																	
Oklahoma City CO	1254	------	------	—	--	----	-----	—	--	---	--	-	—	--	--	----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	—	507
Oklahoma City	1254	967.3	1014.7	61	34	47.5	-2.5	85	22	21	13	0	13	29	57	1.26	-.72	.63	6	3	T	T	18.0	NNW	•55	NNW	29	--	--	—	6.2	—	539
Tulsa	672	989.8	1014.4	60	36	47.7	-1.7	82	22	22	13	0	14	32	62	1.75	-1.23	1.34	6	0	T	T	14.2	NNW	41	NW	23	—	--	--	6.6	51	530
OREGON																																	
Baker	3369	------	------	--	--	----	-----	--	—	---	--	-	--	23	--	----	-----	----	--	-	----	--	8.2	NNW	--	---	--	--	--	--	---	--	---
Baker CO	3446	896.0	1018.8	43	23	32.9	-4.7	62	20	4	11	0	29	--	--	1.32	+.22	.47	10	0	13.5	6	6.6	---	31	SW	15	5	10	16	7.0	56	988
Burns CO	4140	872.3	1017.3	45	22	33.2	-3.1	66	20	-3	10	0	29	20	62	.86	-.07	.24	8	0	17.1	8	----	---	--	---	—	3	12	16	6.8	—	978
Eugene	364	1006.4	1020.5	52	32	42.0	-----	64	19	22	9	0	15	36	81	3.19	-----	.95	16	0	10.8	3	8.2	S	--	---	—	3	4	24	8.1	—	706
Meacham	4050	875.0	1018.3	38	21	29.8	-----	60	20	10	2	0	29	22	75	3.97	-----	1.35	18	0	35.7	39	8.3	SE	--	---	—	1	7	23	8.6	—	1035
Medford	1314	971.6	1020.3	56	31	43.7	-3.2	73	24	23	3	0	19	31	66	.82	-.68	.46	7	0	4.7	4	6.0	N	•42	SSW	8	4	7	20	7.7	—	655
Pendleton	1489	963.1	1017.9	50	32	40.7	-3.7	65	24	24	5	0	19	23	63	1.46	+.03	.42	10	0	4.5	3	10.9	W	--	---	--	7	7	17	7.0	--	750
Portland CO	30	------	------	50	37	43.2	-3.7	64	19	28	5	0	7	--	--	4.70	+.79	.96	18	-	10.4	4	----	---	--	---	--	--	--	--	---	--	669
Portland	21	1018.0	1019.5	49	35	42.0	-2.7	63	24	26	7	0	11	35	73	3.36	-----	1.05	20	0	12.9	5	7.2	SSW	29	W	21	1	3	27	3.7	35	709
Roseburg CO	479	1001.7	1020.7	55	35	44.6	-2.5	71	19	27	3	0	14	—	--	3.25	-.03	.87	15	0	10.4	5	4.5	---	36	SW	°4	3	3	25	3.2	46	623
Salem	195	1012.2	1019.7	50	32	41.0	-5.5	63	19	25	7	0	16	35	81	4.02	+.14	1.09	19	0	10.9	3	8.1	S	--	---	—	1	6	24	8.4	--	740
Sexton Summit CO	3336	------	------	45	28	36.6	-----	62	24	13	5	0	22	—	--	2.89	-----	.61	15	0	30.1	28	----	---	--	---	--	4	6	21	8.1	—	375
Troutdale	29	------	------	50	34	42.0	-----	65	24	24	2	0	15	35	77	5.22	-----	1.22	21	0	15.1	5	8.7	E	•25	SW	15	0	5	26	8.7	--	705
PENNSYLVANIA																																	
Allentown	381	1002.7	1017.3	47	30	38.9	+1.2	61	23	20	27	0	20	30	72	4.45	+1.00	.94	14	0	1.6	1	9.1	NNW	--	---	--	10	6	15	6.4	--	803
Curwensville	2215	------	------	42	23	32.5	-----	57	23	9	11	0	28	25	78	6.24	-----	1.55	18	1	15.0	5	13.5	WNW	•36	ESE	13	4	6	21	7.7	--	997
Erie CO	655	------	------	44	31	37.6	+4.1	69	29	21	22	0	20	--	--	4.10	+1.48	.90	16	3	9.3	4	9.5	---	36	SE	3	5	6	20	7.2	39	843
Harrisburg	335	1003.1	1017.0	49	35	40.9	+2.0	65	30	24	22	0	19	29	66	3.42	+.39	1.07	14	0	2.7	1	10.8	WNW	34	NW	9	6	7	18	6.9	54	742
Park Place	1932	------	------	42	26	33.6	-----	57	30	14	10	0	27	—	--	5.04	-----	1.38	19	0	9.2	2	----	---	--	---	--	8	7	16	7.0	—	967
Philadelphia CO	26	------	------	51	36	43.2	+2.4	64	23	25	10	0	9	—	--	4.76	+1.37	1.47	13	0	.2	T	9.8	---	27	S	30	7	12	12	6.3	57	667
Philadelphia	13	1015.9	1017.0	51	35	43.1	+4.0	64	23	25	10	0	10	31	66	4.52	+1.13	1.35	14	0	T	T	12.5	NNW	•33	E	14	7	8	16	6.7	—	675
Pittsburgh CO	719	------	------	51	33	41.9	+2.4	70	6	21	10	0	15	--	--	4.99	+1.96	1.05	16	-	6.5	-	----	---	--	---	—	—	--	--	---	39	713
Pittsburgh	1248	985.1	1016.3	48	31	39.7	+2.5	70	6	13	10	0	19	28	66	4.54	+1.51	.38	16	2	8.4	1	11.7	WSW	36	W	24	3	10	18	7.7	37	779
Reading CO	266	1004.7	1016.9	50	34	41.8	+1.2	65	30	24	10	0	11	--	--	3.48	-.04	1.06	15	0	.6	T	14.4	---	49	E	19	8	8	15	6.3	54	711
Scranton CO	746	937.1	1016.9	45	31	37.8	+2.1	62	30	19	10	0	20	--	--	3.20	.00	.66	15	1	5.1	2	7.5	---	32	N	10	6	12	13	6.7	43	835
Williamsport	527	997.6	1016.8	47	30	38.2	+.6	63	30	18	27	0	22	27	67	3.91	+.57	.85	14	1	3.5	2	11.3	W	•53	ESE	30	6	10	15	7.0	—	823
RHODE ISLAND																																	
Block Island	110	1012.5	1016.6	44	33	38.5	+3.1	55	31	22	10	0	12	--	--	3.95	+.12	.86	12	0	4.2	2	----	---	--	---	—	4	10	17	7.3	--	81
Providence CO	----	------	------	48	33	40.3	+4.6	68	28	21	10	0	12	--	--	5.58	+2.09	1.73	14	-	4.1	2	----	---	--	---	--	--	--	--	---	--	7
Providence	55	1010.8	1016.9	46	32	38.9	+4.9	64	28	21	10	0	15	28	69	5.29	+1.80	1.88	12	0	2.9	1	10.9	NW	38	W	24	4	6	21	7.7	45	8

See footnotes at end of table.

CLIMATOLOGICAL DATA

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F		°F.				°F.	%	In.	In.	In.			In.	In.	M p h		M p h			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1015.6	- ----	65	51	58.1	+0.7	86	3	31	14	0	0	--	--	3.74	+0.72	1.37	10	0	0.0	0	11.0	---	32	E	13	9	9	13	5.7	59	252
Charleston	41	1016.3	1017.9	67	47	57.3	+2.0	85	8	32	15	0	2	46	71	3.31	+.79	1.47	12	0	.0	0	9.9	W		- -		6	11	11	6.2	--	264
Columbia CO	332	1004.1	------	65	46	55.7	+.5	84	2	30	14	0	1	—	--	1.46	+1.05	1.43	11	0	.0	0	9.1	--	31	W	13	10	7	11	5.9	56	296
Columbia	217	1008.5	1016.9	66	45	55.3	-----	86	2	30	14	0	1	42	66	4.35	-	1.52	12	0	.0	0	8.4	W	--	---	--	10	9	12	5.9	-	313
Florence	146	1011.5	1016.9	67	43	55.0	--- -	84	1	29	15	0	3	41	64	4.20	----	1.33	9	0	.0	0	8.5	WSW	--	- -	--	6	11	11	6.1	-	319
Greenville	1006	978.7	1016.4	61	42	51.7	+1.8	81	3	28	14	0	4	38	67	5.25	+.10	1.19	13	0	T	T	9.1	SW	37	W	21	5	13	13	6.9	55	410
Spartanburg	801	986.3	1016.9	61	43	52.0	+.7	78	8	29	14	0	3	39	67	5.13	+.55	1.14	13	2	.0	0	9.7	WSW	*48	WSW	30	7	11	13	6.5	--	599
SOUTH DAKOTA																																	
Huron	1282	969.5	1019.0	29	10	19.2	-9.7	55	26	-11	8	0	31	14	80	1.53	+.62	.62	9	0	20.3	11	14.9	NNW	49	NW	25	1	10	20	7.9	61	1415
Rapid City	3215	900.4	1013.8	38	12	24.6	-7.0	67	26	-12	8	0	31	12	65	.79	-.18	.44	5	0	6.8	5	14.4	NNW	47	NW	10	6	14	11	6.0	71	1245
Sioux Falls	1420	964.4	1018.3	30	11	20.3	-12.1	50	26	-11	21	0	31	15	82	2.70	+1.39	1.53	10	0	31.5	24	14.5	NNW	*39	WNW	13	2	9	20	7.9	-	1379
TENNESSEE																																	
Bristol	1519	962.1	1016.5	57	36	46.8	-.6	75	3	22	17	0	13	35	63	1.39	+.58	.57	22	1	.4	T	8.8	WSW	--	---	--	5	16	16	7.1	-	558
Chattanooga	670	988.8	1016.8	62	42	51.9	+2.8	81	2	25	22	0	7	40	69	8.34	+2.56	4.66	17	4	T	0	7.7	S	50	NW	25	5	8	18	7.1	30	408
Knoxville	949	980.7	1016.8	60	39	49.6	+2.1	76	3	24	22	0	9	39	72	7.46	+2.41	2.69	18	4	1.2	1	11.1	SW	49	SW	23	5	8	13	7.3	35	471
Memphis CO	---	------	------	--	--	----	----	--	—	--	--	-	--	--	--	----	- --	----	--	-	- --	--	----	---	-	---		-	-			-	403
Memphis	263	1001.0	1015.7	61	43	52.1	+.2	77	2	27	13	0	5	42	69	3.92	+1.48	1.36	13	2	.4	T	14.2	S	46	SW	23	3	8	20	7.9	42	400
Nashville	577	995.9	1016.0	59	40	49.3	+.1	80	2	24	22	0	10	40	75	5.16	+.05	1.19	16	5	8.8	2	9.7	S	42	W	25	7	7	17	7.1	37	483
TEXAS																																	
Abilene	1752	952.9	1013.7	70	43	56.3	+1.1	90	22	20	13	1	4	26	40	.81	-.48	.55	4	1	T	0	16.1	S	49	NW	12	7	10	14	6.1	60	297
Amarillo	3590	886.6	1012.9	60	30	44.8	.5	81	22	16	13	0	22	20	47	.55	-.16	.41	4	0	.3	T	15.5	N	49	N	23			-	5.3	62	617
Austin	515	993.6	1015.0	74	50	61.3	+1.1	89	23	30	14	0	2	44	59	3.73	+1.43	2.68	6	3	T	T	11.1	S	34	NE	17				6.5	50	176
Big Spring	2533	925.2	1014.1	69	44	54.7	.9	86	22	24	13	0	7	25	40	.43	.15	.25	3	2	T	0	15.7	S			--	3	9	14	6.2		323
Brownsville	16	1011.5	1013.3	77	59	68.2	.0	89	28	36	13	0	0	59	80	1.27	-.30	.55	3	1	.0	0	14.7	SE	44	SE	2			-	6.5	41	65
Corpus Christi	10	1013.9	1014.6	76	57	66.5	+3.5	87	28	28	13	0	1	57	80	2.36	+.76	1.55	8	1	T	T	14.1	SSE	46	N	12	5	10	16	6.7	69	37
Dallas	437	996.3	1014.9	69	46	57.5	+.1	87	7	28	13	0	3	37	52	1.15	1.73	.75	3	1	T	0	12.3	S	50	S	2			-	5.9	44	266
Del Rio CO	957	979.3	1013.0	77	52	64.1	+.6	92	6	27	13	2	1	41	50	1.38	+.66	1.16	4	2	.0	0	9.5	---	40	NW	23	11	6	14	6.0	67	151
El Paso	3920	883.5	1011.0	63	42	51.5	-.4	80	9	23	4	0	6	23	34	.59	+.23	.23	5	2	T	T	12.2	WSW	55	W	2				5.5	72	322
Fort Worth	683	991.2	1015.5	69	44	56.3	+.1	88	22	27	13	0	1	34	51	1.33	-.99	.79	6	1	T	0	16.6	S	42	NW	29	-	--		5.3	-	276
Galveston CO	7	------	------	68	58	62.7	+.3	76	11	36	13	0	0	—	-	3.12	+.44	2.11	3		T	T	14.1	---	45	N	12				--	45	118
Galveston	7	1015.9	1015.9	69	57	63.0	+.6	77	11	34	13	0	0	56	82	2.93	+.25	1.34	10	1	.0	0	15.5	SSE				4	11	12	6.3	-	121
Houston CO	41	1011.2	-- ---	73	55	64.0	+.7	86	7	32	13	0	1	-	--	3.92	+.42	2.24	10	3	.0	0	12.4		35	N	12	-	-		6.5	56	119
Houston	41	1013.5	1016.0	73	53	62.9	+.6	87	8	32	13	0	1	51	72	4.94	+1.93	3.15	6	1	.0	0	15.2	S				6	11	14	6.9		136
Laredo	500	993.3	1012.9	80	57	68.6	+.8	93	8	32	13	7	1	51	61	1.02	+.14	.31	6	1	T	0	13.9	SE	--						5.9	-	32
Lubbock	3238	901.1	1013.0	65	34	49.1	-2.8	82	22	20	13	0	17	22	41	.78	-.12	.62	3	1	.0	0	17.0	WSW	*60	NNE	28	6	9	16	6.6		507
Palestine CO	491	997.3	1015.6	70	49	59.3	+.7	85	7	29	13	0	3	-	—	3.94	+.46	2.13	8	2	T	T	10.3		45	W	23	4	12	11	6.6	61	210
Port Arthur CO	5	1014.6	---	70	56	62.9	+1.0	79	7	33	13	0	0	-		6.33	+3.07	4.30	11	3	.0	0	15.1	--	46	E	26			--	6.6	54	133
Port Arthur	5	1014.9	1015.7	72	52	61.3	- --	83	7	31	14	0	2	51	82	4.11		1.97	9	5	.0	0	12.9	S	-	--	-	5	7	19	7.1	--	161
San Angelo	1903	946.8	1015.9	72	43	57.4	+.4	92	7	19	13	1	4	30	42	.47	-.57	.37	4	0	T	0	10.8	SSW	37	N	17	4	11	9	5.6	-	277
San Antonio	732	990.2	1014.5	74	51	62.6	-.2	87	6	27	13	0	1	44	59	2.76	+.92	1.79	7	2	T	T	11.1	SE	43	NE	13				6.6	47	148
Victoria	109	1010.3	1015.0	75	55	64.7	+.5	86	9	33	13	0	0	52	71	2.95	+.67	1.15	10	1	T	0	11.0	SSE	*55	WNW	23	5	10	16	6.6	-	111
Waco	504	995.9	1014.0	73	48	60.4	+1.3	89	7	27	14	0	3	40	53	2.02	1.06	1.54	5	3	T	0	12.3	S			-	10	7	14	5.9	--	202
Wichita Falls	1027	977.7	1014.3	67	37	52.3	-3.7	92	22	24	13	1	9	28	48	2.63	+.79	1.52	4	3	T	T	14.6	S	*40	WNW	10			-	5.9	-	401
UTAH																																	
Milford	5029	844.9	1016.5	51	22	36.6	-3.9	68	25	11	12	0	28	16	48	.48	.50	.24	4	0	6.5	6	12.0	N	--	-	-	12	8	11	5.0	-	876
Salt Lake City CO	4260	------	------	--	--	----	-----	--	--	- -	--	-	--	--	--	--	----	--			--	--				---	-	-		--	-	-	814
Salt Lake City	4222	869.6	1015.9	49	25	37.1	-2.9	68	21	16	3	0	28	23	58	1.26	.54	.73	10	0	3.9	6	8.1	SSE	44	SW	16	7	8	16	6.6	59	861
VERMONT																																	
Burlington	398	1001.4	1016.3	39	26	32.5	+3.4	61	28	15	1	0	26	25	75	2.57	+.53	.60	17	1	7.0	2	10.9	S	56	S	30	3	5	23	7.9	33	1006
VIRGINIA																																	
Cape Henry CO	16	1016.3	1016.9	54	40	46.9	+.3	71	7	32	27	0	2			3.27	.66	1.73	12	1	T	0	13.3		47	N	9	3	11	12	6.0	52	551
Lynchburg	947	932.1	1016.9	55	35	45.4	0	74	7	24	10	0	13	33	65	3.49	.05	.94	13	0	T	0	10.6	SSW	34	S	23	6	11	11	6.7	45	600
Norfolk CO	11	1011.2	------	57	41	48.3	+.6	72	29	30	10	0	2		-	2.99	.73	1.44	10	1	T	T	10.4	--	31	N	9	-	-	--		54	494
Norfolk	25	1016.6	1017.7	56	39	47.6	+1.6	73	29	29	27	0	1	36	69	2.90	.37	1.43	11	1	T	0	12.2	S	--	------	--	8	7	16	6.2	-	552
Richmond CO	162	------	------	57	37	47.3	+.1	76	30	27	10	0	9			3.23	.15	1.13	11		.1	T	--		--	--- -		--	--	-			543
Richmond	160	1011.2	1017.3	57	37	46.8	+.7	76	30	26	10	0	10	34	67	2.35	----	1.01	11	1	T	T	9.5	WSW	33	NW	7	9	8	11	6.2	59	559
Roanoke	1192	974.6	1016.3	55	36	45.4	-1.9	73	7	25	27	0	13	32	61	1.06	+.74	1.33	11	1	4.3	1	9.3	W		- - -	-	5	10	16	7.2	--	599
Urbanna	31	------	--- -	57	37	47.0	-- --	75	31	26	27	0	11	-	-	5.67	-- -	1.31	11	0	T	0	----	-			-	--	-	--	--	--	550
Washington CO	- -	-- --	- -	54	37	45.5	+2.9	72	7	27	10	0	9			3.17	.58	1.34	15	1	.3	T	8.6	--	31	W	30		-	-	-	55	593
Wash. Nat'l.	11	1013.2	1017.3	54	37	45.6	+3.0	71	7	27	10	0	9	32	62	2.92	-.43	1.14	15	1	1.0	T	11.7	NW	60	E	1	3	9	14	6.2	54	597
WASHINGTON																																	
Ellensburg	1727	953.6	1017.3	46	23	34.4	6.5	61	20	-1	10	0	23	26	7	.95	+.40	.27	11	0	15.5	10	10.6	WNW				3	10	18	6.5	--	913
Kelso	17	------	----	49	32	40.6	-----	65	19	26	5	0	13	-		5.26	-	.34	21	0	16.1	3	--	---		-		1	3	27	8.9	-	754
North Head CO	194	1010.5	1013.3	47	36	41.5	3.7	66	19	28	1	0	7		—	6.19	+.62	1.90	22	0	9.0	3	15.7	-	54	W	1	2	7	22	8.1	56	720
Olympia	190	1010.5	1018.0	48	31	39.1	---	66	19	23	11	0	19	34	85	5.39	—	1.35	19	0	20.6	12	5.3	S	-			1	5	25	8.9	-	786
Port Angeles	11	1016.6	1017.7	45	36	40.3	----	55	29	26	5	0	8	34	73	1.35	- -	.50	14	0	3.4	1	10.5	W		-		3	6	22	8.1	-	743
Seattle	14	1017.0	1018.0	--	--	----	-----		-	--	-	-		34	71		- -	-			----	--	9.6	S		-					--	-	-
Seattle CO	14	------	--- -	49	36	42.6	-3.3	61	19	29	5	0	3			2.66	-.39	.77	13	0	7.5	2	11.0	- -	56	SW	15	1	5	22	7.3	50	636
Spokane	2357	946.5	1016.9	42	26	34.3	-5.1	59	24	10	6	0	26	25	70	1.72	+.52	.40	11	0	12.4	6	10.2	SSW	50	SW	15	1	6	21	7.4	37	944
Stampede Pass CO	3960	876.4	1017.6	32	21	26.8	----	51	20	9	5	0	31	-	--	9.20	----	2.07	26	0	72.0	137	13.4	--	73	SW	15	3	7	21	8.4	-	1178
Stevenson CO	319	------	------	47	34	40.7	- --	61	24	26	5	0	9	-		8.11	---	1.44	19	0	41.1	15	-	--	--	-		2	4	25	8.7	--	748
Tacoma CO	127	1010.5	1017.6	47	35	40.9	-3.3	62	19	25	5	0	10	--		3.16	-.32	1.33	18	0	12.7	5	9.2	-	37	SW	15	2	11	15	7.2	39	740
Tatoosh CO	101	1013.5	1017.0	45	36	40.5	-2.4	56	19	25	6	0	7	34	80	8.43	+.58	2.93	20	0	24.7	16	15.3	E	61	W	15	3	2	26	8.5	32	752
Walla Walla	1200	------	------	--	--	----	-----	--	-	-	-	-	--	30	-	----	----	----	-	-	----	-	9.3	S		-	-	-	-	-	---	--	-
Walla Walla CO	949	981.4	1017.6	51	34	42.5	3.6	69	24	26	2	0	13		--	1.50	-.11	.53	10	0	5.5	3	7.1	-	38	W	15	6	10	15	6.9	54	694
Yakima	1061	977.3	1017.1	51	25	37.9	-5.9	66	20	4	10	0	21	26	61	.89	+.66	.61	6	0	9.9	7	7.7	W	-		--	10	8	13	6.2	--	834
Seattle-Tacoma	379	1003.4	1017.3	46	32	39.4	—	63	19	24	2	0	17	33	80	3.76	- -	1.11	20	0	18.2	6	11.5	SW	-	-		1	7	23	8.2		789
WEST VIRGINIA																																	
Charleston	950	980.4	1016.5	57	35	45.8	-- -	76	29	22	22	0	17	33	66	6.19	----	1.39	13	1	7.6	1	10.1	SW	*35	WNW	24	2	10	19	7.3	-	538
Elkins	1969	942.1	1016.9	51	29	39.6	+.5	70	23	13	17	0	21	30	70	4.02	+.22	1.08	18	2	6.2	3	7.1	SSE	12	E	13	1	11	19	7.9	59	779
Huntington	565	-----	------	59	36	47.5	+5.5	75	26	24	17	0	11	-	--	4.49	+.19	.93	13	-	2.0	T	----	---	-	---		-		--		--	523
Parkersburg CO	615	------	------	54	33	43.9	+1.1	75	23	22	10	0	18	--	--	6.37	+2.83	1.47	17	1	4.9	3	6.3	--	29	NW	24	5	9	17	7.0	54	647
Parkersburg	837	------	1016.3	--	--	----	----	--	--	--	--	-	-	31	-	----	---	----	-	-	---	--	9.7	WSW	-		-	--	--	--	--	--	- -
Petersburg	1013	979.0	-----	54	32	42.9	- - -	74	23	18	27	0	17	-	--	3.70	-- --	1.23	11		2.5	2	--- -	-	--	-	-	6	9	16	6.7	--	679
WISCONSIN																																	
Green Bay	639	988.2	1015.0	34	19	26.2	-2.4	49	27	2	25	0	26	17	72	2.66	+.62	.36	14	0	14.1	9	14.4	NE	63	W	1	7	6	13	6.8	51	1131
La Crosse CO	- ---	------	- ----	--	--	----	-----	--	--	--	--	-	--	--	--	---	-----	----	--		----	--	----					-	-	--	---	--	1192
La Crosse	669	990.2	1015.7	33	17	24.9	-4.9	51	27	-1	9	0	28	17	75	3.32	+2.21	.94	14	0	23.3	10	11.9	NW	*30	WSW		--	--	-	7.0		1237
Madison CO	----	------	------	--	--	----	-----	--	--	--	--	-	—	--	--	-----	----	- --	--	-	----	--	--- -	---			-	-	-	--		--	1137
Madison	857	982.4	1015.0	37	21	28.7	-1.9	57	6	5	9	0	23	21	76	2.13	+.06	.57	13	2	7.1	4	17.3	WSW	45	W	3		--		6.9	45	1115
Milwaukee CO	----	------	------	--	--	----	-----	--	--	--	--	-	- -	-	--	-- -	----	---	-	-	-----	--	---	---		-	-		--			-	1033
Milwaukee	674	988.5	1014.6	33	21	30.9	+.3	60	6	3	9	0	26	23	76	3.33	+.91	.35	13	2	15.3	8	15.3	WSW	47	W	3	-	--	--	7.1	46	1052

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

MARCH 1951

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
WYOMING																																	
Casper	5322	832.7	1014.2	42	16	28.7	-6.0	64	26	-9	3	0	31	15	57	0.44	-0.71	.18	9	0	13.2	7	12.0	SW	--	----	--	5	9	17	6.6	—	1121
Cheyenne	6139	806.6	1014.6	42	16	29.2	-3.9	64	26	0	3	0	31	13	54	.51	-.51	.24	10	0	5.3	2	15.3	WNW	43	NW	16	7	16	3	5.7	71	1103
Lander	5563	831.0	1015.3	43	17	29.8	-2.6	61	26	-7	3	0	31	15	55	1.12	-.07	.43	10	0	14.6	7	8.0	---	56	SW	°4	4	14	13	6.1	60	1082
Rock Springs	6741	789.4	1016.5	38	17	27.5	-3.3	54	21	6	11	0	31	15	61	.43	-.24	.30	7	0	7.0	4	13.5	W	*62	WSW	16	3	10	13	7.3	--	1155
Sheridan	3942	882.3	1018.6	38	13	25.7	-5.7	58	25	-11	7	0	31	14	64	1.20	+.04	.49	8	0	21.6	12	9.2	NW	56	NW	5	8	12	11	5.8	68	1211
PACIFIC AREA																																	
Canton Island	12	1008.1	1008.6	88	79	83.4	-----	93	13	78	2	8	0	74	79	.07	-----	.05	3	0	.0	0	---	---	--	---	--	9	21	1	4.5	—	0
Hilo	23	1011.5	1012.9	79	64	71.3	-----	88	27	60	26	0	0	65	83	16.42	-----	2.93	21	3	.0	0	6.3	SW	31	SE	27	2	8	21	8.1	35	0
Honolulu CO	12	------	------	77	68	72.0	+.6	80	3	63	13	0	0	--	--	15.96	+12.76	4.08	16	2	.0	0	---	---	--	---	--	--	--	--	---	--	0
Honolulu	7	1012.5	1013.1	79	67	72.6	-----	83	29	62	17	0	0	65	77	20.79	-----	5.43	13	3	.0	0	10.8	ENE	59	SE	26	5	10	16	7.0	46	0
Lihue	115	1007.5	1012.5	78	64	70.9	-----	81	13	56	15	0	0	64	82	14.54	-----	4.34	22	3	.0	0	9.3	E	32	S	21	4	13	14	7.0	41	0
Wake Island	11	1014.9	1015.5	81	73	76.6	-----	83	29	68	18	0	0	66	71	.73	-----	.22	12	0	.0	0	14.8	E	--	---	--	5	22	4	5.2	--	0
PUERTO RICO																																	
San Juan CO	----	------	------	79	69	73.9	-1.5	--	--	---	--	-	-	--	--	.55	-2.60	----	--		----	--	----	---	--	---	--	--	--	--	---	--	0
San Juan	9	1013.5	1015.3	79	68	73.9	-----	°81	11	64	10	0	0	63	70	.45	-----	.24	9	0	.0	0	10.8	ESE	25	E	16	13	11	2	3.7	73	0
ALASKA																																	
Anchorage	134	1003.5	1013.5	26	-1	12.5	-11.2	45	28	-20	6	0	31	2	61	.42	-.13	.40	3	0	7.7	21	5.5	N	34	N	4	10	7	14	5.7	61	1622
Annette Island	110	1009.8	1013.9	37	28	32.1	-7.1	47	20	9	5	0	20	24	73	10.45	2.05	2.13	21	0	10.4	7	14.4	SE	--	---	--	2	1	23	8.9	--	1014
Barrow	22	1030.8	1031.5	-11	-21	-15.9	-1.4	1	10	-40	4	0	31	-24	60	.03	-.11	----	2	0	.3	10	----	ENE	36	NE	20	16	9	6	3.5	--	2516
Bethel	21	1014.2	1015.6	11	-9	.7	-10.9	41	31	-32	13	0	31	-6	67	3.09	2.17	.35	13	0	36.1	45	10.6	N	*28	N	25	8	3	20	6.8	--	1995
Cordova	40	1009.8	1011.5	33	8	20.4	-9.9	44	29	-15	5	0	29	15	75	3.37	-1.17	1.92	13	0	18.3	38	4.4	E	--	---	—	10	4	17	6.3	--	1374
Fairbanks	436	1001.7	1020.0	15	-16	-.5	-8.9	51	31	-41	2	0	31	-10	59	.22	-.25	.14	5	0	5.3	34	4.7	N	29	NE	10	15	4	12	4.7	68	2030
Galena	120	1015.9	1021.0	6	-22	-8.2	-13.6	31	31	-46	2	0	31	-19	52	.24	-.48	----	3	0	2.5	--	----	NNE	--	---	--	16	7	3	4.0	—	2271
Gambell	25	1019.6	1020.7	9	-2	3.5	-2.5	25	14	-26	2	0	31	-5	72	1.71	.51	.50	14	0	17.1	14	19.2	NNE	63	SE	14	8	11	12	6.0	--	1905
Juneau	15	1013.7	1014.6	31	21	26.0	-6.8	46	21	-2	4	0	24	19	73	3.75	.70	.84	19	0	23.1	10	9.3	E	40	SE	25	3	3	25	8.5	31	1203
Kotzebue	10	1023.1	1023.7	2	-14	-6.5	-5.6	25	19	-36	2	0	31	-12	71	.14	-.14	.09	3	0	1.6	20	14.3	E	--	---	-	14	7	10	4.5	--	2213
McGrath	334	1004.7	1018.3	12	-16	-2.1	-10.4	37	31	-34	8	0	31	-11	64	.32	-.72	.12	7	0	12.2	33	4.1	N	*26	NE	10	9	9	13	5.6	--	2092
Nome	13	1019.9	1020.7	9	-8	.5	-8.2	23	31	-37	2	0	31	-6	67	.17	-.67	.05	5	0	2.3	30	11.6	ENE	50	NE	10	13	6	12	4.7	--	1994
Northway	1713	952.9	1019.6	13	-21	-3.8	-12.1	39	27	-50	5	0	31	-13	61	.10	.15	.10	2	0	1.3	13	2.9	NW	--	---	--	9	6	16	5.8	--	2135
St. Paul Island	22	1013.2	1014.2	28	19	23.6	-.3	33	4	-2	27	0	29	19	79	1.51	-.15	----	23	0	10.5	6	----	---	-	---	--	1	5	25	8.9	—	1275
Umiat	337	1013.4	1032.9	-18	-35	-26.8	-13.3	-7	19	-50	17	0	31	-32	71	.13	.05	.05	7	0	2.3	12	7.7	W	—	--	--	12	10	9	4.7	--	2342
Wales	9	1021.8	1022.4	5	-11	-2.9	-.4	22	7	-40	2	0	31	-8	75	.03	-.57	.03	2	0	.3	21	----	- -	--	---	--	9	13	9	5.7	—	2108
Yakutat	23	1010.3	1012.8	33	17	25.2	-6.8	42	29	-10	9	0	29	19	76	9.59	.11	3.33	19	0	35.2	33	10.0	E	*39	E	1	6	3	22	7.5	--	1228

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
° Other dates also.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

MARCH 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	326	2681	2457
Mobile (CO)	165	1608	1511
Mobile	187	1680	
Montgomery (CO)	237	2060	1976
Montgomery	244	2210	1976
ARIZONA			
Flagstaff	936	5454	5914
Payson (CO)	601	2915	
Phoenix (CO)	129	969	1387
Phoenix	147	1093	
Prescott	640	3339	
Tucson	230	1313	
Winslow	634	2629	
Yuma	74	629	1013
ARKANSAS			
Ft. Smith	454	3217	3035
Little Rock	392	2952	2832
Texarkana	306	2475	
CALIFORNIA			
Bakersfield	231	1639	
Beaumont (CO)	406	1991	
Bishop	518	3210	
Blue Canyon	771	4227	
Burbank	229	1227	
Eureka (CO)	597	3288	3620
Fresno	348	2052	2195
Los Angeles (CO)	168	921	1103
Los Angeles	251	1308	
Mt. Shasta (CO)	776	4553	
Oakland	360	2071	
Red Bluff	332	2294	2394
Sacramento (CO)	326	2036	2356
Sacramento	357	2162	
Sandberg (CO)	594	3031	
San Diego	191	1020	1257
San Francisco (CO)	330	2226	2413
San Francisco	407	2227	
San Jose	330	1788	
Santa Catalina	317	1539	
Santa Maria	365	1987	
COLORADO			
Alamosa	1040	6795	
Colorado Springs	979	5292	
Denver	898	4943	4984
Grand Junction	739	4719	
Pueblo	830	4762	4888
CONNECTICUT			
Bridgeport	793	[illegible]	
Hartford	801	4887	5329
New Haven	794	4683	5090
DELAWARE			
Wilmington	717	4450	
DIST. OF COLUMBIA			
Washington (CO)	598	3730	4106
Washington	597	3749	
FLORIDA			
Apalachicola	127	1376	1212
Daytona Beach	105	1034	
Fort Myers	15	485	
Jacksonville (CO)	95	1230	[illegible]
Jacksonville	121	1335	
Key West (CO)	0	85	59
Key West	0	104	
Melbourne	63	677	
Miami (CO)	8	294	182
Miami Beach	1	168	
Int. Airport, Hialeah	4	252	
Orlando	70	771	
Pensacola (CO)	157	1448	1238
Tallahassee	151	1543	
Tampa	42	654	560
West Palm Beach	21	311	
GEORGIA			
Albany	182	1870	1595
Atlanta (CO)	410	2896	2781
Atlanta	373	2778	
Athens	391	2891	
Augusta	291	2492	2185
Columbus	283	2391	
Macon	254	2216	2215
Rome	399	3152	
Savannah	223	1969	1563
Valdosta	165	1701	
IDAHO			
Boise	860	4718	4894
Lewiston	776	4414	
Pocatello	980	5575	5737
ILLINOIS			
Cairo (CO)	549	3169	3661
Chicago (CO)	907	5463	5425
Chicago	915	5874	
Chicago University	924	5650	
Joliet	931	6152	
Moline	1020	6166	
Peoria	931	5780	5362
Springfield (CO)	841	5137	4921
Springfield	876	5440	
INDIANA			
Evansville	700	4499	4031
Ft. Wayne	874	5723	5470
Indianapolis (CO)	796	5007	4872
Indianapolis	837	5324	
South Bend	918	5855	
Terre Haute	814	5223	
IOWA			
Burlington	1019	6004	
Charles City (CO)	1284	7351	6755
Davenport (CO)	1011	5952	5604
Des Moines	1122	6222	5893
Dubuque	1168	6573	6082
Keokuk (CO)	1001	5617	5112
Sioux City	1197	6504	6178
KANSAS			
Concordia (CO)	893	4927	4900
Dodge City	808	4537	4559
Goodland	961	5217	
Topeka (CO)	827	4625	4620
Topeka	835	4833	
Wichita	772	4285	4242
KENTUCKY			
Lexington	711	4540	4303
Louisville (CO)	669	4185	4018
Louisville	674	4321	
Pikeville (CO)	518	3578	
LOUISIANA			
Baton Rouge	198	1599	1455
Lake Charles	170	1477	
New Orleans (CO)	130	1177	1171
New Orleans	132	1322	
Int. Airport, Moisant	159	1363	
Shreveport	246	2128	2043
MAINE			
Caribou	1233	7718	
Eastport	990	5967	6836
Greenville (CO)	1215	7423	7935
Portland	976	5903	6194
MARYLAND			
Baltimore (CO)	611	3765	4037
Baltimore	665	4156	
Frederick	677	4355	
MASSACHUSETTS			
Boston	797	4442	5087
Milton	913	5252	
Nantucket	808	4408	4769
Pittsfield	1005	6166	
MICHIGAN			
Alpena (CO)	1107	6716	6898
Detroit	878	5546	5685
Escanaba (CO)	1189	7408	7322
Grand Rapids (CO)	913	5642	5813
Grand Rapids	957	6017	
Lansing	[illegible]	6113	
Marquette (CO)	1213	7404	7237
Muskegon	988	6059	
Sault Ste. Marie	1207	7804	7779
Ypsilanti	896	5701	
MINNESOTA			
Duluth (CO)	140	8709	8170
Duluth	1446	9050	
International Falls	1517	9630	
Minneapolis	1353	7653	7067
Rochester	1348	7858	
St. Cloud	1450	8472	7787
St. Paul	1342	7632	
MISSISSIPPI			
Jackson	242	2155	2060
Meridian	249	2285	2205
Vicksburg	226	2070	1977
MISSOURI			
Columbia	812	4871	4599
Kansas City	803	4630	[illegible]
St. Joseph	893	5122	
St. Louis (CO)	741	4508	4197
St. Louis	765	4653	
Springfield	687	4337	4146
MONTANA			
Billings	1313	6496	6237
Butte	1373	8302	
Glasgow (CO)	1617	8654	
Great Falls	1422	6912	
Havre (CO)	1498	7829	7328
Helena	1356	7313	6686
Kalispell	1155	6794	6769
Missoula	1086	6625	6466
NEBRASKA			
Grand Island	1039	5737	
Lincoln (CO)	991	5508	5382
Lincoln	1028	5775	
Norfolk	1195	6294	
North Platte	1028	5640	5628
Omaha	1055	5870	5504
Valentine (CO)	1236	6360	6273
NEVADA			
Elko	939	5551	
Ely	1008	5756	
Las Vegas	319	2127	2520
Reno	818	4561	4729
Tonopah	741	4942	4922
Winnemucca	894	4917	5386
NEW HAMPSHIRE			
Concord	971	[illegible]	6355
Mt. Washington	1574	[illegible]	
NEW JERSEY			
Atlantic City	698	3873	4285
Newark	717	[illegible]	4861
Trenton	715	4289	4636
NEW MEXICO			
Albuquerque	572	3384	4099
Clayton	787	4283	
Roswell	466	3071	3327
Raton	905	5065	
NEW YORK			
Albany	916	5721	5831
Bear Mountain (CO)	911	5449	
Binghamton (CO)	909	5518	5893
Binghamton	928	5814	
Buffalo	917	5543	5819
New York (CO)	721	4092	4613
La Guardia Field	698	4021	
Oswego	916	5597	
Rochester	908	5640	5814
Schenectady (CO)	898	5587	
Syracuse	921	5742	5929
NORTH CAROLINA			
Asheville (CO)	538	3784	3792
Asheville	564	4042	
Charlotte (CO)	395	2942	2983
Charlotte	415	3083	
Greensboro	519	3621	
Hatteras (CO)	416	2375	2326
Raleigh (CO)	436	2994	3013
Raleigh	476	3218	
Wilmington (CO)	310	2299	2251
Winston-Salem	503	3473	
NORTH DAKOTA			
Bismarck	1680	8865	7845
Devils Lake (CO)	1641	9470	8796
Fargo	1523	8840	
Grand Forks	1507	9094	8671
Williston (CO)	1680	8826	8132
OHIO			
Akron	877	5705	
Cincinnati (CO)	665	4309	4475
Cincinnati	763	4868	
Cleveland (CO)	832	5105	5283
Cleveland	828	5286	
Columbus (CO)	734	4882	4884
Columbus	773	5169	
Dayton	816	5339	4810
Sandusky (CO)	811	5155	5285
Toledo	877	5639	5462
Youngstown	889	5666	
OKLAHOMA			
Oklahoma City (CO)	507	3247	3409
Oklahoma City	539	3365	
Tulsa	530	3432	
OREGON			
Baker (CO)	989	5605	5961
Baker	1021	5911	
Burns (CO)	978	5643	
Eugene	706	3610	
Meacham	1085	6118	
Medford	355	3688	3966
Pendleton	750	4448	
Portland (CO)	669	3477	3640
Portland	709	3756	
Roseburg (CO)	623	3171	3578
Salem	740	3759	
Sexton Summit (CO)	875	4922	
Troutdale	705	3849	
PENNSYLVANIA			
Allentown	803	4986	
Curwensville	997	6334	
Erie (CO)	813	5108	5420
Harrisburg	742	4707	4818
Park Place	967	5845	
Philadelphia (CO)	667	3953	4229
Philadelphia	677	4120	
Pittsburgh (CO)	713	4552	4725
Pittsburgh	779	4958	5006
Reading (CO)	711	4368	4642
Scranton (CO)	835	5075	5431
Williamsport	823	5288	5350
RHODE ISLAND			
Block Island	813	4273	4817
Providence (CO)	758	4359	5149
Providence	801	4649	
SOUTH CAROLINA			
Charleston (CO)	232	1973	1776
Charleston	261	2179	
Columbia (CO)	300	2414	2343
Columbia	313	2604	
Florence	317	2537	
Greenville	410	3059	2839
Spartanburg	399	3073	
SOUTH DAKOTA			
Huron	1415	7465	7026
Pierre	1407	6791	6477
Rapid City	1245	6404	6151
Sioux Falls	1379	7229	
TENNESSEE			
Bristol	558	3960	
Chattanooga	408	3141	3013
Knoxville	471	3419	3373
Memphis	400	3106	2899
Nashville	483	3602	3337
TEXAS			
Abilene	297	2350	2439
Amarillo	617	3626	3794
Austin	176	1536	1628
Big Spring	328	2379	
Brownsville	63	618	616
TEXAS (Cont'd.)			
Corpus Christi	87	889	947
Dallas	260	2178	2261
Del Rio (CO)	131	1369	1457
El Paso	322	2215	2413
Ft. Worth	276	2211	2241
Galveston (CO)	118	1080	1146
Galveston	121	1115	
Houston (CO)	118	1164	
Houston	136	1304	1277
Laredo	82	836	
Lubbock	507	3241	
Palestine (CO)	210	1858	1977
Port Arthur (CO)	133	1248	1313
Port Arthur	161	1442	
San Angelo	277	2121	
San Antonio	148	1511	1394
Victoria	111	1077	
Waco	202	1916	
Wichita Falls	401	2793	
UTAH			
Milford	876	5081	
Salt Lake City (CO)	814	4442	4892
Salt Lake City	861	4720	5247
VERMONT			
Burlington	1000	6265	6912
VIRGINIA			
Cape Henry	551	3068	3145
Lynchburg	600	3925	3688
Norfolk (CO)	494	2893	3043
Norfolk	532	3140	
Richmond (CO)	543	3434	3564
Richmond	559	3580	
Roanoke	599	3941	
Urbanna	550	3114	
WASHINGTON			
Ellensburg	943	5882	
Kelso	754	4124	
North Head (CO)	720	4181	[illegible]
Olympia,	796	4427	
Port Angeles	743	[illegible]	
Seattle (CO)	686	3648	3920
Seattle	789	[illegible]	
Spokane	944	5588	5425
Stampede Pass (CO)	[illegible]	7310	
Stevenson (CO)	748	[illegible]	
Tacoma (CO)	[illegible]	3978	4100
Tatoosh Island (CO)	752	4659	4516
Walla Walla (CO)	694	4110	4314
Yakima	834	5169	4958
WEST VIRGINIA			
Elkins	779	5157	5024
Huntington	538	[illegible]	
Parkersburg (CO)	[illegible]	4389	[illegible]
Petersburg	679	[illegible]	
Charleston	568	3986	
WISCONSIN			
Green Bay	1184	7622	6855
La Crosse (CO)	1192	6944	6606
La Crosse	1237	7404	
Madison (CO)	1137	6822	6477
Madison	1115	7016	
Milwaukee (CO)	1033	6292	6019
Milwaukee	1052	6557	
WYOMING			
Casper	1121	6219	
Cheyenne	1103	6048	6191
Lander	1082	6358	7009
Rock Springs (CO)	1054	6032	
Rock Springs	1155	6597	
Sheridan	1211	6475	
ALASKA			
Anchorage	1622	10064	
Annette Island	1014	6090	
Barrow	2516	15550	
Bethel	1995	10807	
Cordova	1374	8665	
Fairbanks	2030	13196	
Galena	[illegible]	13141	
Gambell	1905	11046	
Juneau	1203	8066	
Kotzebue	2218	12588	
McGrath	[illegible]	12625	
Nome	1994	94207	
Northway	2135	14269	
St. Paul	1275	8015	
Yakutat	1228	7868	
Umiat	2842	16062	
Wales	2108	11867	

Data from airport unless otherwise specified. CO indicates data from city office.

SEVERE STORMS

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
South Dakota, eastern portion	2	10:30 a.m.							Snow	Snow 3 to 8 inches with high wind caused closing of schools and highways.
Scott County, Iowa	2	3:30-7p.m.					$8,800		Ice (glaze)	Eighteen telephone poles north of Davenport down; 45 long-distance lines broken.
Osborne, Mitchell, and Cloud Counties, Kans.	2	4-5 p.m.			0	0	See remarks	See remarks	Tornado and hail	Tornado moved from near Corinth northward to Downs and eastward to Beloit and Jamestown, damaging some buildings, uprooting trees, and cutting wide path through wheat field. Hail covered ground at Jamesto
Brown County, Kans.	2	8:30 p.m.			0	0	500		Tornado	One barn destroyed 1 1/2 miles south of Hiawatha. Roaring noise heard by a few people. Debris plainly indicated a twisting wind, but no funnel cloud observed due to darkness.
Rock Island County, Ill.	2	Evening					12,000		Ice (glaze)	All damage to utility lines.
Idaho, entire State	4-5						See remarks		Wind and snow.	High winds and blowing and drifting snow blocked road in many localities throughout State, in some places until 9th or 10th, at others for 2 days only. School closed 2 days or more at many points. Storm conditions generally described as "blizzard" by most observers. Although stormy period described as "tou on livestock", no losses were reported. Thunder and lightning reported at a few points on night of 4th-5th. Damage to telephone and power lines at scatter points.
Bynum, Mont.	4-10								Blizzard and severe cold	Some young calves and lambs lost due to severe cold and intermittent blizzard conditions. Roads blocked
Helmville, Mont.	5				3				Blizzard	Blizzard and subzero cold resulted in 3 persons freez ing to death in a stalled car.
Greenville, Pa.	7	Morning							Electrical	Lightning struck two power lines and darkened town for nearly an hour.
Richmond, Va.	7	6:45 p.m.					1,000		Wind	Store windows blown out. Street barricades and light blown down. Gutter on residence blown off, falling on electric wires and setting fire to house.
Nebraska, from Phelps and Harlan Counties eastward	10	Most of day	†65	100			See Nebraska storm of 17th		Ice (glaze)	Many wires prostrated and communication and power services crippled by freezing rain. Highway accidents generally of minor character, but numerous.
Chattanooga, southwestern Comanche County, Okla.	10	10-11 p.m.	200	1/2			4,000		Wind	An area of 3 town blocks in Chattanooga damaged by wind.
Iowa	10-13								Snow	Snowfall of 12 to 18 inches in central and 19 to 24 inches locally in northwest and southeast. Snow, drifted by winds, blocked at least 16 of the numbered highways; 200 semi-trailers and trucks snowbound, 16 of them between Nevada and Marshalltown. About 100 long-distance circuits out in southern Iowa. All traffic halted; a state of emergency declared in Cedar Rapids to facilitate clearing of streets. Sno fell continuously for 85 to 92 hours.
Missouri, northern portion	10-14	All day					200,000		Ice (glaze) and snow	Counties within 75 miles of the northern border of State suffered damage to telephone and power lines and tree limbs. Counties most affected were Worth, Gentry, Harrison, Grundy, Livingston, Putnam, Sulliv Schuyler, Adair, and Macon. Phone lines damage alon amounted to $130,000. Heavy drifted snow added to effectiveness of isolation of several communities.
Tampa, Fla.	12	11:50a.m.	[illegible]	1/2			950		Wind	Wind accompanying thunderstorm blew in plate glass window and blew down a flag pole and a few trees.
Nokomis (15 miles south of Sarasota) Fla.	12	Early evening	75		0	0	45,000		Tornado	Tornado moved eastward inland from Gulf of Mexico; damaged seven homes and eight other buildings. Roofs blown from a restaurant and a home; another home moved off its foundation. Wire lines severed.
Clearwater, Fla.	12				0	0			Waterspout	Waterspout observed over Gulf of Mexico.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Baltimore and surrounding counties, Md.	13-14	P.m. 13th and a.m. 14th					$10,000		Wind and rain	One plate glass window, 15 by 15 feet blown in with a shattering crash. An advertising sign 50 by 30 feet smashed seven cars on an auto sales storage lot. The sign caved in roofs and hoods of automobiles, damaging them badly. In another location a tree fell on a 1951 automobile, crushing it badly. At Kenwood Beach in Calvert County, State Police had to rescue a family from their home when first floor was inundated. A dozen small craft torn from their moorings and pounded about in yacht basins of Maryland and Annapolis Yacht Clubs. Trees uprooted in all sections of city.
Mississippi, southeastern portion	14							$280,000	Freeze	Ten percent of tung blossoms frozen; damage minor compared with 85 percent losses in nearby Louisiana Parishes. Apparently only a slight difference in temperatures or in duration of freezing temperatures made the difference in losses.
Louisiana, southern half	14							1,850,000	do	Eighty-five percent of tung blossoms killed by freeze; blossoms at critical stage when freezing temperatures most damaging. Spring beans and Irish potatoes killed; 25 to 40 percent of immature strawberries ruined.
Washington, entire State	15	All day					See remarks		Wind	Strong winds from a general State-wide storm did sporadic damage, in the main, relatively small and without definite estimate as yet of monetary loss. Clarkston Heights, Asotin County, in extreme southeastern Washington reported some damage to power and telephone lines, with occasional uprooting of trees. Kennewick, Benton County, had winds which caused soil erosion in winter wheat fields; estimates of damage cannot be made until later. Near Forks, Clallam County, an earlier heavy snowfall, combined with wind, collapsed a barn. Highest wind speed at Seattle City Office was 50 m.p.h. from southwest at 11:52 a.m., but with only very minor damage in city area.
Nez Perce and Clearwater Counties, Idaho	15	Afternoon				See remarks	See remarks		do	Some property damage and bodily injuries reported from Lewiston. Electric service disrupted for about 4 hours in vicinity of Orofino.
Stevensville, Mont.	15						10,000		do	Three barns wrecked and many other buildings damaged. Windows broken and trees uprooted.
Rock Springs, Wyo.	16	2:10 a.m.					8,000		do	Screen at drive-in theater blown down.
Montana, counties north of Missouri River	16								Blizzard	Several stations reported worst blizzard in section. Old timers stated it was the worst they had ever seen. Some newly born calves lost. Roads blocked.
Nebraska, eastern portion	17	Most of day	†150	150			See remarks		Ice (glaze) in extreme southeast and snow in northeast	Snow in extreme northeast much heavier than elsewhere, amounting to 15 inches at Niobrara, in Knox County. Much drifting; serious interruption of traffic for some days on country roads; main highways closed in places for a few days. Blizzard conditions reported locally. Damages from the glaze storms of 10th and 17th combined in a single estimate of $70,000.
Clarksville and Johnson County, Ark.	17	3:30 p.m.				1	40,000	10,000	Wind and hail	Hail damaged 200 to 300 homes. Man injured on face and body when flying tin from unroofed barn struck him. Hail killed 1,000 broilers, when wind unroofed brooder house. Hailstones up to 9 inches in circumference reported.
Texarkana and vicinity, Ark.	17	6:15 p.m.							Wind	High tension line blown down. Gusts of 54 m.p.h. recorded at Texarkana.
El Dorado, Ark.	17	8 p.m.							Electrical	El Dorado High School and an automobile parked nearby struck by lightning. Automobile damaged severely.
Batesville, Ark.	17	Afternoon							Wind	Two houses unroofed. Brooder house blown away, scattering 2,500 chickens. Trees and signs blown down.
Kansas, western two-thirds of State	23	All day							Wind and dust	Northwest wind reached velocities of 45 to 55 m.p.h., with gusts of 60 to 70 m.p.h. Some local dust blowing and fields damaged, especially where bare and of light soil.
St. Louis County, Mo.	23	Afternoon and evening					7,000		Wind	Straight winds, with cold front, downed trees, broke plate glass windows, and plucked shingles from roofs. Gusts estimated as high as 60 m.p.h. in newspaper accounts.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wisconsin, eastern portion	23	Afternoon and night							Snow	Three to 6 inches of new snow. High wind caused much drifting. Two freight trains stalled by drifts. Highway traffic badly disrupted.
Romney, Ind.	23	Afternoon	200				$500		Wind	Path eastward. Damage to trees and outbuildings.
South Dakota	23								Snow	Frequent snow in southeast and 4-inch snow over State.
Fort Wayne Airport, Ind.	23-24	2 p.m.23d to p.m. 24th					550		Wind	Damage to parked aircraft; one airplane a total loss.
Meadville, Pa.	24	Morning					See remarks		Wind and electrical	Considerable damage to buildings and television towers from high winds. Lightning killed 3 head of cattle in northwestern Crawford County.
Island of Oahu, Hawaii	26-27						210,000	$1,053,000	Rain and wind	Wind unroofed several small buildings, damaged small boats in harbor, and disrupted electrical services. It reached speed of 59 m.p.h. at Honolulu Airport. Many homes evacuated in Kailua area on windward side of Island, where water in residential area attained depth of 3 to 5 feet over considerable area. Hundreds of persons inoculated to prevent possible spread of disease. National Guard patrolled area, and Red Cross rendered aid. Property damage by wind estimated at $40,000; flooding $170,000. Fruit and truck crops in Waimanalo district severely damaged. Papaya grove losses extremely heavy; prices of remaining fruit doubled.
Northeastern Woods County and extreme northwestern Alfalfa County, Okla.	27	6:30 p.m.		10	0	0			Tornado	Tornado moved northeastward, continuing into Barber County, Kansas. It did not touch ground. Heavy rain accompanied tornado. Funnel observed by several person
Barber County, Kans.	27	6:30 p.m.		15	0	0			do	Tornado sighted above ground near Kiowa. It had moved from near Capron, Okla. Never touched ground, but accompanied by heavy rain and light hail.
Mississippi, central portion	27-29				2	1	750,000	Some	Rains	Torrential rains began in Vicksburg area 27th and swept east-northeastward across State. Area of heavies rains extended from Vicksburg through Germania, Yazoo City, Pickens, Kosciusko, Vaiden, and Ackerman, spreading out over an area extending from Tupelo to Brookville. Heaviest 48-hour fall was 15.07 at Okalona, with 11.11 at Germania and 10.67 at Vicksburg ranking next. A secondary area of 48-hour rains exceeding 6 inches extended from Brookhaven to Meridian and southward to Bucatunna. Heavy washing of hills in Vicksburg caused damages of $100,000. Similar damage and damages to highways, streets, etc., occurred over remainder of the two areas. A train derailed at Panola, Ala., from washout of track on the Noxubee just across the border. Resultant flood damage not included in total.
San Antonio, Tex.	28	12:58a.m.						10,000	Hail	Hailstones the size of moth balls generally. Heaviest hail in southwestern portion of city.
Crockett (near), Houston County, Tex.	28	5:10 a.m.	†3		0	0	2,500	1,300	Tornado	Storm 8 miles west of Crockett. Same storm observed in Angelina County, where it did not touch ground.
Crossett, Ark.	28	7 a.m.					100,000		Wind and electrical	Lightning struck main switch at Crossett Paper Mills and set fire to plant.
New Mexico, Raton and northeastern portion	28	A.m.			1				Snow and wind	Storm of blizzard proportions made all travel difficult, closed schools, and resulted in one death.
Kansas, southwest and south-central portions	28	Daytime					185,000		do	Most of Kansas from Smoky Hill River south and west of Hutchinson and Wichita affected by storm. Power and telephone lines damaged and traffic interrupted. Winds reached 50 m.p.h. Many school busses did not operate. Visibility reduced to less than 1/4 mile at many locali
New Orleans, La.	28	Afternoon				1			Electrical	Airplane mechanic struck by lightning; later recovered.
Lake Charles, La.	28				1				Rain	Child drowned.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Greenfield and northeastern Hancock County, Ind.	29	6:30-7p.m.	400	2	0	2	$100,000		Tornado	All buildings on one farm demolished. A farmer injured and dazed when blown into a field. One other house and several barns and outbuildings demolished. A few head of livestock destroyed. Many buildings damaged, trees blown down, etc. Path northeastward.
Idaho, southwestern counties.	29	Evening							Wind and snow	High winds and snow accompanied passage of a cold front, with Boise and vicinity experiencing greatest force of storm. Some 25 rural telephone lines downed and power lines broken in a few places, as wind reached an extreme speed of 55 m.p.h. at Boise, a new record for March.
Galeton, Pa.	29-30								Rains	Heavy rains plus melting snows sent streams over banks, causing several local railroad track washouts and halting highway travel in spots.
Gettysburg, Pa.	30	4 p.m.			0	0	1,000		Tornado and rain	House 4 miles west of town unroofed by freak twister during heavy rain.
Lawrenceville Pa.	30								Rains	Roads flooded and traffic held up several hours.
Morris, Passaic and Bergen Counties, N.J.	30-31	P.m.30th-a.m.31st					500,000		do	Rather heavy rains throughout State, but heaviest concentrated in northern portion. Hundreds of homes flooded and thousands of occupants had to be evacuated. Roads obstructed. One small dam burst. Most rivers and smaller streams overflowed their banks, and even the Delaware as far south as Trenton reached flood stage. Very little damage in Trenton area.
James River Valley, S. Dak.	31								Snow	Five inches of snow kept highway maintenance and transportation costs high.

PRELIMINARY TOTALS BY STORM TYPES FOR MARCH 1951

Type	Deaths	Injuries	Damage
Tornado		2	$ 150,300
Wind		1	1,235,000
Hail			60,000
Ice and glaze			290,800
Freeze	3		2,130,000
Rain	3	1	1,420,000
Electrical		1	100,000
Snow	1		85,000
Total	7	5	$5,471,100

† Miles instead of yards.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

MARCH 1951

Severe and record breaking floods occurred in several streams in the East Gulf of Mexico drainage during the latter part of the month. The overflows along the Warrior and Tombigbee Rivers were the worst since 1900. Record breaking floods occurred along the Coosa River in Alabama and the Oostanaula River in Georgia; near record floods occurred along the Cahaba River in Alabama. The ice break-up began in the Missouri River on Mar. 26th and progressed rapidly upstream from Decatur, Nebr., to Pierre, S. Dak., by the end of the month. Flooding along the main stem was minor in comparison to recent years.

ST. LAWRENCE DRAINAGE.--Some flooding occurred in the Lake Erie drainage along the St. Joseph River at Montpelier, Ohio, near the middle and end of the month. No damage resulted.

ATLANTIC SLOPE DRAINAGE.--The Connecticut River rose rapidly to above bank-full stage in the reach between Hartford, Conn., and Holyoke, Mass., due to the heavy rain on the 30th and 31st. Warm temperatures during that period caused considerable snow melt and helped to raise the river to bank-full stage.

The Mohawk and Hudson Rivers rose to near bank-full stages during the period from Mar. 30th to Apr. 1st. Minor flooding occurred in low areas along the Mohawk at Schenectady, N. Y., and along the Hudson at Troy, N. Y. Severe flooding occurred along Schoharie and Esopus Creeks during the night of the 30th due to heavy rain (3.33 to 6 inches over Catskill area) during the afternoon and evening of the 30th. Heavy damage resulted from the flash flooding in the Catskill area.

Heavy rains in the upper Delaware River from the 29th to the 31st caused flood stages in the Downsville, N. Y., area and between Easton, Pa., and Trenton, N. J. Total precipitation for the storm averaged between 2.5 and 3 inches with locally heavier precipitation over the East Branch of the Delaware River. The runoff on the Beaver Kill River was reported to be one of the heaviest of record although the crest at Downsville was 2 feet lower than during the storm of Nov. 25, 1950. Heavy rainfall and considerable damage occurred along the Neversink and Pequest Rivers.

Some flooding occurred along the Susquehanna River at a few points towards the close of the month due to moderately heavy rain together with some snow melt. The flooding along the Chemung and Chenango Rivers on the 31st and Apr. 1st was also due to a combination of heavy rain and snow melt. Only minor damage resulted from the flooding in the Chemung Basin.

Near bank-full stage was reached in the lower Potomac at the Leiter gage near Washington, D. C., on Apr. 1st due to heavy precipitation in the upper and lower reaches on Mar. 30th.

Moderate rises occurred in the James River between the 19th and 21st and on the 30th and 31st. The only flood stage reached was at State Farm, Va., on Apr. 2d. In each rise the bulk of the water came from the upper reaches of the river.

Minor flooding occurred along the Roanoke River at Williamston, N. C., on the 25th, 26th and 27th due to the heavy rainfall on the 13th and 14th which ranged from 1 to 1.5 inches.

The flooding along the Yadkin River at Wilkesboro, N. C., on the 30th was due to moderate rainfall on the 29th and 30th.

EAST GULF OF MEXICO DRAINAGE.--Severe and serious flooding occurred on the Oostanaula, upper and middle Coosa, and Cahaba Rivers towards the end of the month due to excessively heavy precipitation on the 28th and 29th. The crest of 34.8 feet on the Oostanaula River at Resaca, Ga., on the 31st was 1.3 feet higher than the previous highest stage of record (33.5 feet) which occurred on Jan. 21, 1947. The Coosa River also exceeded the previous highest stage of record of 30.0 feet at Childersburg, Ala., by 0.1 foot on the 30th. Near record stages occurred on the Cahaba River at Centerville and Marion Junction, Ala. Practically all streams were at abnormally and unseasonably low levels before these heavy flood producing rains occurred near the end of the month. The 24-hour rainfall amounts on the morning of the 29th averaged 5.59 inches over the Oostanaula; 2.74 inches over the Etowah; 5.58 inches over the Coosa; 1.52 inches over the Tallapoosa; 5.09 inches over the Alabama and 5.54 inches over the Cahaba. Rainfall during the previous 24-hour period ranged from 1 to 2.5 inches.

The worst flood since 1900 occurred on the Warrior and Tombigbee Rivers near the end of the month due to unusually heavy rains on the 28th and 29th. Most of the crests occurred after the end of the month. The rain was the heaviest over the middle reaches of the upper Tombigbee and over the headwaters of the Warrior River. In this area the rains averaged around 7.5 inches in 48 hours. Considerable damage resulted from this flood.

The highest stages and stream flow ever recorded occurred on the Yokahockany and Lobutcha drainage areas of the upper Pearl River near the end of the month due to heavy rain during the night of the 28-29th. On the Chickasawhay, serious floods occurred in the reach from above Enterprise, Miss., to below Waynesboro, Miss., and on the Leaf from the vicinity of Beaumont to below Merrill, Miss. Approximately 50 families were evacuated in the Meridian, Miss., area as a result of the Sowashee Creek flood.

UPPER MISSISSIPPI BASIN.—The ice moved out of the Mississippi River at La Crosse, Wis., on the 13th of March, 9 days earlier than average. The heavy snow cover during the winter had reduced the ice thickness considerably. Streams were rising towards the end of the month as the spring runoff was just starting from melting snow. Bank-full stage was reached on the 30th at Steuben, Wis., near the mouth of the Kickapoo River.

The Rock River at Moline, Ill., continued in flood from Feb. 19 through Mar. 15th. The river remained high at this point due to snow melt and above normal precipitation.

The Illinois River continued in flood at Beardstown, Ill., from Feb. 18 through the end of the month. It receded to within its banks at Havana, Ill., by Mar. 13th and at Peoria and La Salle, Ill., during the latter half of the first decade. Minor flooding occurred along the Bourbeuse and Meramec Rivers around the middle of the month due to heavy rains during the 48-hour period ending during the morning of the 12th.

MISSOURI BASIN.—The ice break-up in the Missouri River was retarded by cold weather during the first three weeks of the month. Starting on Mar. 26, the ice break-up progressed rapidly upstream from Decatur, Nebr., to Pierre, S. Dak., by the end of the month. Flooding along the main stem due to snow melt runoff and ice gorging was minor in comparison to recent years, reaching stages of 1.8 feet above flood stage at Nebraska City and 0.5 feet above flood stage at St. Joseph, Mo.

Lone Tree Creek, a tributary of the Yellowstone River, overflowed when two dams broke on the 26th, inundating much of the city of Sidney, Mont., and blocking highways with huge ice floes. Considerable property damage resulted.

The Big Sioux River Valley had a rather heavy accumulation of snow, over most of its length, when the first protracted period of thawing began on the 26th. The heaviest snow cover lay over that portion of the river system between Hawarden, Iowa, and Brookings, S. Dak. The potential runoff from snow cover in this segment of the river valley varied from 2.5 to 4 inches. The snow cover was not quite so heavy at the source regions of the Big Sioux near Watertown, S. Dak., nor from Hawarden, Iowa, to the mouth of the river. The ice broke up at Akron, Iowa, on the 27th and progressed upstream to Sioux Falls, S. Dak., by the end of the month. Above Sioux Falls, the ice broke up around Volga, S. Dak., on the 30th. Serious ice jams occurred in the reach between Volga and Sioux Falls, S. Dak., at the same time that the river was being swollen by snow water. This ice jamming continued to develop north of Sioux Falls during the first week of April, and caused the most serious flooding along the Big Sioux River in recent years. The flooding was due entirely to melted snow and ice jams; rain was not a factor.

The flooding along the Floyd River was due almost entirely to snow melt. A heavy snow mantle covered the basin when the first major thawing began on the 25th. Samples of snow showed a potential runoff of 1 to 2 inches in Plymouth County in Iowa and from 2 to 4 inches from the Plymouth and Sioux County lines on upstream to the headwaters of the Floyd. The winter's ice had broken up, from Merrill to Sioux City, Iowa, the last week in February. New ice formed again during March, but it was light. While the ice remained in the upper reaches of the Floyd and its tributaries the amount of ice was small and it had little to do with the flooding. Two pronounced crests appeared on the Floyd at James, Iowa. The first crest reached 19.94 feet on Mar. 28 and the second crest reached 18.4 feet on Apr. 5. The first crest of 19.94 feet appears to be the highest crest on record for a flood caused by snow melt. Flooding on the Floyd River continued until the 9th of April.

Some flooding occurred in the Heart and Cannonball basins towards the end of the month due to snow melt and ice jams. The water content of the snow over the Heart River basin averaged 2.5 inches before the warm weather set in during the third week of March. Flooding began on the Heart River (25 miles west of Mandan, N. Dak.) on the 27th and was still overflowing in the Mandan vicinity after the close of the month. No flooding occurred in Mandan as the city was protected by dikes, but east and west of the city lowlands were covered with ice and water. Minor flooding occurred in the lower reaches of the Cannonball River. Flooding along the Knife River was somewhat more severe and began on the 29th.

The Little Sioux River at Correctionville, Iowa, reached bank-full stage on the 28th and tributaries of the Little Sioux River below Correctionville equalled record stages on the same day. Local flooding occurred on the Soldier, Boyer and Nishnabotna Rivers, while the Nodaway reached flood stage near its confluence with the Missouri.

Heavy accumulations of snow in March over the northern half of the Elkhorn River basin caused damaging floods near the close of the month. The most severe flooding occurred along the North Branch River from Pierce to Norfolk, Nebr., and along the Elkhorn in the Beemer-West Point area. The overflow along the North Branch was the heaviest since the disastrous floods of May 1944; the water levels were generally about one foot lower than in May 1944. Damage was heavy from Pierce southward to Norfolk, Nebr., and in the Beemer-West Point area. Thousands of acres of farm land were flooded between Osmond and Norfolk, Nebr., with loss of hay and grain in storage, damage to farm buildings and fences, and some loss of young livestock. A large number of residences in the towns of Osmond and Pierce and in the northern part of Norfolk were surrounded by flood waters with resultant damage to basements, basement apartments, and first floors of homes; in some cases the water was high enough to cause evacuation of the occupants. Damage to highways and bridges in the flooded sections was heavy. In the Beemer-West Point area the water was high enough to force evacuation of several farm and town dwellings.

Three periods of moderate to heavy rains over the Lamine River basin resulted in three minor overflows in the Clifton City, Mo., area during the first two decades of the month. Some flooding occurred along the lower Grand River at Brunswick, Mo., from Mar. 30th to Apr. 2d from rainfall averaging 1.25 inches during the period from the 27th to the 30th.

OHIO BASIN.--Precipitation over the Ohio basin during March averaged slightly above normal but was the lightest since last November. Precipitation occurred on several days but covered limited areas and the storm totals were less than in past months.

Minor local flooding occurred in the headwaters of the Allegheny River at Port Allegany, Pa., due to rainfall averaging 1.25 inches on the 25th.

In the Green River basin moderate flooding resulted in the middle reach during the third week, while the lower reach remained above flood stage at Rumsey, Ky., throughout the month due to backwater from a moderately high Ohio River. The Green has been in flood at Rumsey, Ky., since Jan. 6 which is the longest period of continuous flooding on record at this station.

In the Wabash basin minor flooding occurred at some points along the upper reaches. In the lower reaches, both the Wabash and White Rivers were receding from moderate flood stages at the beginning of the month. Minor flooding occurred again late in March. There was also some light overflows in the Scioto basin.

Heavy rains occurred over the Tennessee River basin during the 48 hours ending on the 29th. Several stations in the southern portion of the basin reported amounts in excess of 6.5 inches. Practically all of the larger creeks which drain directly into the main river between Pickwick Dam and Knoxville, Tenn., reached or exceeded flood stage. During this flood, the highest known stages were reached on the Cypress, Big Nance and South Chickamauga Creeks and on the Toccoa, Little and Little Pigeon Rivers. The crest on the Elk River at Fayetteville, Tenn., was 4.5 feet below that of Feb. 1 of this year and 2 feet above flood stage. The First Creek at Knoxville, Tenn., exceeded flood stage by 1 foot. There was some flooding along the main stem of the Tennessee River below Guntersville, Ala., Wilson, Pickwick and Kentucky Dams.

The chief damage from these floods was to roads. No agricultural damage resulted as crops had not been planted and all movable property had been moved to higher ground during the earlier flood of this year on Feb. 1.

Three moderate rises occurred along the main stem of the Ohio River beginning on the 4th, 19th and 30th. The last rise continued into April before cresting. Flood stage was exceeded in the lower portion below Dam 46.

WHITE, RED AND ARKANSAS BASINS.--The flooding in the White and Red River basins during March was a continuation of the floods that developed in February except for the secondary crests on the White at Augusta, Ark., on the 18th and on the Black River at Black Rock, Ark., on the 19th. Damage from the continued high water was negligible except for delays in the preparation of lowlands adjacent to the streams for spring planting.

Near flood stage was reached on the Poteau River in the Arkansas basin on the 11th. The Illinois River also reached near bank-full stage at Tahlequah, Okla., on the 12th.

LOWER MISSISSIPPI AND ATCHAFALAYA BASINS.--The St. Francis River continued in flood at Fisk, Mo., until the 5th and at St. Francis, Ark., until the 10th. Moderate rainfall on the 11th and 12th (1.5 inches) caused another rise to slightly above flood stage. Only light damage resulted from the February and March overflows.

The Yazoo River remained above flood stage at Yazoo City, Miss., throughout the month of March. It began overflowing at this point on Jan. 22. It crested on Mar. 28 at a stage of 36.6 feet after a rise of 4.6 feet during the 24-hour period ending at 7 a.m. on the 28th following a heavy rain of 4 to 7 inches. It did not reach bank-full stage further upstream at Greenwood, Miss. The Tallahatchie River continued in flood at Swan Lake, Miss., until the 9th of the month. It had been in flood since Jan. 5. It rose to above flood stage again on the 30th following the heavy rain on the 28th and 29th. Sharp rises occurred in the middle and lower reaches of the Big Black River following the 7-inch rainfall on the 28th and 29th. At Bovina, Miss., the river rose 14 feet in a 24-hour period. Record crests occurred in the reach between West and Bovina which were roughly half a foot above the previous record stages.

The Atchafalaya River continued in flood at Atchafalaya, La., throughout February and March. It crested on Mar. 20 at a stage of 28 feet. Onshore winds resulted in some overflow at Morgan City, La., from the 27th to the 29th. No damage resulted.

WEST GULF OF MEXICO DRAINAGE.--Heavy rises occurred in the middle and lower Sabine River following the heavy rain during the period from the 26th to the 29th. The rain averaged 3.5 inches in the middle and lower reaches and 1 inch in the upper Sabine. Minor flooding resulted at Bon Wier, Tex., from the 30th to Apr. 3d. Near bank-full stages occurred on the Calcasieu at Kinder, La., and on the Nezpique at Basile, La., at the end of the month.

The flow in the Rio Grande at Brownsville, Tex., during the past 12 months has been described by "Old Timers" as the lowest they have ever seen. Three-fourths of the time there has been no flow past the gage.

COLUMBIA BASIN.--Minor flooding occurred in the lower reaches of the Santiam River on the 16th. Moderate rises occurred in other rivers including the Willamette but there was no flooding. The rise of the Santiam to slightly above flood stage was the 13th time since last October that bank-full stage had been reached or exceeded at this point. No damage resulted from this freshet.

FLOOD STAGE DATA

(All dates in March unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest *	
		From–	To–	Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE Lake Erie					
St. Joseph: Montpelier, Ohio	10	15 31	17 31	10.9 11.0	16 31
ATLANTIC SLOPE DRAINAGE					
Downs Brook: Downsville, N. Y.	10	30	Apr. 1	12.7	31
Delaware:					
Easton, Pa.	22	31	Apr. 1	23.4	Apr. 1
Trenton, N. J.	12	Apr. 1	Apr. 1	12.0	Apr. 1
Chenango:					
Sherburne, N. Y.	8	31	31	9.2	31
Greene, N. Y.	8	31	Apr. 1	9.3	31
Whitney Point, N. Y.	12	30	Apr. 1	13.4	31
Binghamton, N. Y.	16	31	31	16.3	31
Chemung:					
Corning, N. Y.	16	31	31	18.0	31
Elmira, N. Y.	12	31	31	16.6	31
Chemung, N. Y.	12	31	Apr. 1	19.2	31
West Branch: Williamsport, Pa.	20	31	31	20.2	31
Susquehanna:					
Oneonta, N. Y.	12	25 30	25 Apr. 1	12.7 15.8	25 31
Bainbridge, N. Y.	13	31	31	13.0	31
Towanda, Pa.	16	31	Apr. 1	18.9	Apr. 1
Wilkes-Barre, Pa.	22	Apr. 1	Apr. 1	22.7	Apr. 1
Roanoke: Williamston, N. C.	10	20	29	10.6	25–27
Yadkin: Wilkesboro, N. C.	14	30	30	15.0	30
Saluda: Pelzer, S. C.	6	31	31	6.5	31
EAST GULF OF MEXICO DRAINAGE					
Oostanaula:					
Resaca, Ga.	22	29	**	34.8	31
Rome, Ga.	25	29	**	30.6	30
Coosa:					
Gadsden, Ala.	20	29	**	28.9	31
Childersburg, Ala.	20	29	**	30.1	30
Wetumpka, Ala.	45	29	**	47.9	30
Cahaba:					
Centerville, Ala.	23	28	**	35.3	29
Suttle, Ala.	32	29	**	42.0	31
Marion Junction, Ala.	36	30	**	41.8	31
Alabama:					
Montgomery, Ala.	35	30	**	----	—
Millers Ferry, Ala.	40	30	**	----	—
Black Warrior:					
Tuscaloosa Lock and Dam, Ala.	47	29	**	66.0	29
Lock No. 9	30	29	**	48.5	31
Lock No. 8	30	29	**	54.4	Apr. 1
Lock No. 7, Eutaw, Ala.	35	29	**	56.9	Apr. 2
Tombigbee:					
Aberdeen, Miss.	34	29	**	42.6	31
Columbus, Miss.	29	29	**	38.0	Apr. 1
Gainesville, Ala.	36	29	**	52.8	Apr. 4
Lock No. 4, Demopolis, Ala.	39	20 29	26 **	45.6 66.9	23 Apr. 5
Lock No. 3	33	Feb. 2 8 19	3 11 **	52.9 36.8 63.2	Feb. 11 9 Apr. 7
Lock No. 2	46	22 29	27 **	49.0 64.8	24 Apr. 8
Lock No. 1	31	Feb. 6 21	3 **	36.2 45.8	Feb. 17 Apr. 11
Sowashee Creek: Meridian, Miss.	15	28	29	20.0	29
Chickasawhay:					
Enterprise, Miss.	20	28	**	31.7	31
Shubuta, Miss.	30	29	**	39.9	Apr. 2
Waynesboro, Miss.	35	30	**	40.0	Apr. 3
Leaf: Beaumont, Miss.	20	—	--	25.7	Apr. 1
Pascagoula: Merrill, Miss.	22	29	**	24.6	Apr. 2
EAST GULF OF MEXICO DRAINAGE (Cont.)					
Bogue Chitto: Franklinton, La.	11	29	**	15.6	31
Pearl:					
Edinburg, Miss.	20	29	**	26.2	31
Goshen Springs, Miss.	20	30	**	26.4	Apr. 2
Jackson, Miss.	18	19	**	34.4	Apr. 4
Monticello, Miss.	15	28	**	22.2	30
Columbia, Miss.	17	29	**	21.3	Apr. 2
Bogalusa, La.	15	Feb. 1 15 18	12 16 **	19.1 15.3 19.4	Feb. 22 15 Apr. 2
Pearl River, La.	12	Feb. 2 19	6 **	14.9 16.2	Feb. 20 Apr. 3
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Rock: Moline, Ill.	10	Feb. 19	15	12.7 14.6 12.9	Feb. 24 Feb. 25 1
Iowa: Wapello, Iowa	10	3	4	10.4	3
Salt: New London, Mo.	19	18 30	18 31	19.5 19.6	18 30
Illinois:					
La Salle, Ill.	20	Feb. 19	6	25.5	Feb. 20
Peoria, Ill.	18	Feb. 21	8	21.2	Feb. 23
Havana, Ill.	14	Feb. 19	18	19.3	Feb. 24
Beardstown, Ill.	14	Feb. 18	**	21.6	Feb. 28
Bourbeuse: Union, Mo.	15	13	13	15.5	13
Meramec:					
Sullivan, Mo.	11	12	13	12.2	12
Pacific, Mo.	11	12	14	16.0	14
Valley Park, Mo.	14	13	14	16.2	14
Mississippi:					
Keokuk, Iowa	12	31	**	----	—
Gregory Landing, Mo.	12	31	**	----	—
Quincy, Ill.	14	30	**	----	—
Hannibal, Mo.	13	1 30	5 **	13.8 ----	2–3 —
Louisiana, Mo.	14	31	**	----	—
Missouri Basin					
Big Sious: Akron, Iowa	12	27	**	----	—
Floyd:					
Merrill, Iowa	12	27	**	14.2	28
James, Iowa	16	26	**	19.9	28
North Branch: Pierce, Nebr.	12	23	28	14.4	27
Elkhorn:					
West Point, Nebr.	12	23	29	14.2	25
Winslow, Nebr.	14	26	27	14.7	26
Nodaway: Clarinda, Iowa	14	28	28	14.5	28
Grand: Brunswick, Mo.	12	30	Apr. 2	13.8	31
Lamine: Clifton City, Mo.	15	3 11 17	3 12 18	16.5 17.8 17.4	3 11 18
Missouri:					
Nebraska City, Nebr.	15	27	30	16.8	29
St. Joseph, Mo.	17	29	31	17.5	30
Ohio Basin					
Allegheny: Port Allegany, Pa.	9	31	31	10.5	31
Scioto: Piketon, Ohio	15	31	31	15.3	31
Green:					
Lock No. 4, Woodbury, Ky.	33	19	24	37.4	21
Lock No. 2, Rumsey, Ky.	34	Feb. 1	31	42.0 39.5	Feb. 27 26
West Fork:					
Anderson, Ind.	10	19 24	19 24	10.1 10.1	19 24
Edwardsport, Ind.	12	Feb. 14 18	8 28	20.6 15.6	Feb. 25 20–21
White: Petersburg, Ind.	16	Feb. 16 19	4 28	22.8 18.5	Feb. 28–1 23–24
Wabash:					
La Fayette, Ind.	11	16	19	11.6	16

FLOOD STAGE DATA

(All dates in March unless otherwise specified)

Table 5-Continued

River and station	Flood stage	Above flood stages -dates		Crest*	
		From–	To–	Stage	Date
	Ft.			Ft.	
MISSISSIPPI SYSTEM (Cont.) Ohio Basin (Cont.)					
Wabash: (Cont.)					
Terre Haute, Ind.	14	Feb. 17	3	22.8	Feb. 23
		20	21	14.2	20-21
Vincennes, Ind.	16	Feb. 21	7	23.4	Feb. 28
					2
Mount Carmel, Ill.	17	Feb. 18	[illegible]	24.1	1-2
New Harmony, Ind.	15	Feb. 21	9	19.7	3
First Creek: Knoxville, Tenn.	5	29	29	6.3	29
South Chickamauga Creek: Chickamauga, Tenn.	10	28	Apr. 1	20.7	30
Elk: Fayetteville, Tenn.	659	29	30	662.8	29
Tennessee:					
Whitesburg, Ala.	560	28	Apr. 3	570.5	30
Florence, Ala.	18	28	Apr. 3	24.2	29
Savannah, Tenn.	80	29	Apr. 3	85.4	Apr. 1
Gilbertsville, Ky.	34	Feb. 1	**	44.3	Feb. 26
				45.6	Apr. 4
Ohio:					
Dam No. 47, Newburgh, Ind.	33	Feb. 6	4	42.5	Feb. 24
		19	28	40.2	25
Dam No. 48, near Henderson, Ky.	38	Feb. 7	5	39.9	Feb. 17
				42.2	Feb. 26
		21	28	39.2	24
Mount Vernon, Ind.	35	Feb. 8	9	37.2	Feb. 11
				40.7	1
		20	29	37.1	25
Dam No. 49, Uniontown, Ky.	37	Feb. 10	11	37.8	Feb. 12
				43.4	2
		21	29	38.6	26
Shawneetown, Ill.	33	Feb. 7	**	44.0	2
				38.5	26
Dam No. 50, Fords Ferry, Ky.	34	Feb. 6	**	46.8	1
				40.8	26
Dam No. 51, Golconda, Ill.	40	Feb. 21	8	43.7	Feb. 28
Paducah, Ky.	39	Feb. 21	8	42.3	Feb. 26
		31	**	----	--
Dam No. 52, Brookport, Ill.	37	Feb. 6	16	41.6	Feb. 11
				44.8	Feb. 26
		19	24	38.4	22
		28	**	----	--
Dam No. 53, near Mound City, Ill.	42	Feb. 8	17	45.0	Feb. 11
				50.3	Feb. 25
		18	25	44.1	22
		28	**	----	--
Cairo, Ill.	40	Feb. 19	25	49.0	Feb. 26
		29	**	----	--
White Basin					
Black: Black Rock, Ark.	14	Feb. 19	10	23.1	Feb. 22
White:					
Newport, Ark.	26	Feb. 22	3	28.5	Feb. 23
Augusta, Ark.	32	Feb. 23	13	33.6	Feb. 27
		18	20	32.0	19
Georgetown, Ark.	21	Feb. 23	25	24.7	1
Des Arc, Ark.	24	Feb. 25	24	27.8	2
Clarendon, Ark.	26	Feb. 24	Apr. 5	29.9	5
St. Charles, Ark.	25	Feb. 27	Apr. 9	27.8	[illegible]
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.	20	Feb. 17	5	24.0	Feb. 24-25
		13	21	21.2	15
St. Francis, Ark.	18	Feb. 13	10	19.1	Feb. 16-17
				21.1	Feb. 25-26
		17	**	19.4	22
Tallahatchie: Swan Lake, Miss.	26	Jan. 5	9	29.4	Jan. 10
				29.1	Jan. 16-17
				29.4	Feb. 23
		30	**	----	--
Yazoo: Yazoo City, Miss.	29	Jan. 22	**	33.3	Feb. 28
				36.6	28
Mississippi:					
New Madrid, Mo.	31	Feb. 22	14	38.5	Feb. 27
Caruthersville, Mo.	32	Feb. 22	15	36.7	Feb. 28
Memphis, Tenn.	34	Feb. 27	11	35.3	4

River and station	Flood stage	Above flood stages -dates		Crest*	
		From–	To–	Stage	Date
	Ft.			Ft.	
MISSISSIPPI SYSTEM (Cont.) Atchafalaya Basin					
Atchafalaya:					
Atchafalaya, La.	25	Feb. 13	**	28.0	20
Morgan City, La.	6	27	29	6.7	28
WEST GULF OF MEXICO DRAINAGE					
Sabine:					
Gladewater, Tex.	26	Feb. 26	2	28.0	1
Bon Wier, Tex.	17	30	Apr. 3	18.1	Apr. 1
PACIFIC SLOPE DRAINAGE Columbia Basin					
Santiam: Jefferson, Oreg.	13	16	16	13.7	16

* Provisional.

** Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

MARCH 1951

	ALBANY, N. Y. (1007 MB.)				ALBUQUERQUE, N. MEX (834 MB.)				ATLANTA, GA. (981 MB.)				BIG SPRING, TEX. (924 MB)				BISMARCK, N. DAK. (958 MB.)				BOISE, IDAHO (915 MB)				BROWNSVILLE, TEX. (1013 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	86	0.9	78	31	1,620	8.9	32	31	307	11.6	67	28	784	12.0	32	31	505	-12.1	83	31	868	3.5	60	31	6	18.5	82
1,000	31	139			31	88			31	149			28	111			31	173			31	141			31	117	18.6	78
950	31	554	-0.1	70	31	530			31	585	11.3	63	28	551			31	571			31	567			31	562	17.4	72
900	31	983	-2.3	69	31	990			31	1,030	9.4	63	28	1,006	13.4	29	31	986	-9.3	70	31	1,006	4.0	49	31	1,018	16.3	58
850	31	1,435	-4.4	71	31	1,464			31	1,502	6.8	66	28	1,485	11.2	29	31	1,428	-8.9	59	31	1,468	1.4	47	31	1,504	14.7	46
800	31	1,911	-5.3	66	31	1,967	8.0	27	31	1,998	4.7	62	28	1,987	8.0	31	31	1,897	-9.5	54	31	1,953	-2.1	53	31	2,015	13.0	40
750	31	2,418	-7.1	60	31	2,500	4.0	28	31	2,530	2.4	58	28	2,523	4.6	36	31	2,402	-11.0	51	31	2,465	-5.6	58	31	2,565	10.8	35
700	31	2,952	-9.1	55	31	3,051	-0.5	29	31	3,077	-0.0	53	28	3,075	1.3	38	31	2,921	-13.8	49	31	3,000	-9.1	60	31	3,126	7.4	35
650	31	3,529	-11.8	52	31	3,637	-5.3	34	31	3,672	-3.1	47	28	3,673	-2.7	39	31	3,493	-16.6	46	31	3,576	-12.3	58	31	3,735	3.3	36
600	30	4,137	-14.8	49	31	4,260	-10.1	36	31	4,298	-6.3	39	28	4,297	-7.0	40	31	4,078	-19.9	44	31	4,178	-15.7	57	31	4,376	-1.3	34
550	30	4,791	-18.9	48	31	4,926	-14.9	38	31	4,975	-10.3	42	25	4,977	-11.5		31	4,731	-23.7	42	31	4,833	-19.4	51	31	5,065	-5.8	
500	30	5,494	-23.5	45	30	5,635	-19.8	39	31	5,701	-14.8	46	24	5,694	-16.5		31	5,410	-28.1	43	31	5,531	-24.1	48	30	5,802	-11.0	
450	30	6,259	-28.4	40	30	6,410	-25.0	39	31	6,496	-20.2	47	22	6,487	-21.4		31	6,166	-33.0	42	29	6,286	-29.5	49	30	6,608	-16.7	
400	30	7,092	-34.2		29	7,254	-31.1	39	31	7,353	-26.0	46	22	7,339	-27.8		31	6,978	-38.8		26	7,121	-35.4	51	30	7,478	-22.8	
350	30	8,013	-40.3		29	8,188	-37.4		31	8,306	-33.1	45	21	8,281	-35.0		30	7,889	-44.9		25	8,045	-41.6		30	8,442	-30.3	
300	30	9,050	-46.4		29	9,235	-45.1		30	9,367	-41.3		21	9,339	-42.7		30	8,904	-51.3		25	9,074	-48.6		30	9,519	-38.6	
250	29	10,240	-52.5		28	10,432	-53.1		29	10,581	-50.4		18	10,545	-51.8		29	10,078	-54.9		24	10,255	-55.7		30	10,743	-48.7	
200	26	11,662	-56.3		28	11,848	-58.6		29	12,007	-58.2		16	11,985	-57.2		26	11,507	-53.9		22	11,662	-59.0		30	12,179	-57.3	
175	26	12,510	-55.7		28	12,688	-58.0		29	12,847	-58.7		16	12,826	-58.5		23	12,354	-54.4		22	12,500	-57.9		30	13,018	-59.6	
150	24	13,488	-56.0		27	13,659	-59.1		29	13,811	-60.1		16	13,793	-60.1		19	13,345	-54.9		20	13,479	-57.2		29	13,978	-62.7	
125	23	14,644	-57.1		26	14,800	-61.6		27	14,936	-62.8		16	14,920	-63.5		17	14,510	-55.4		20	14,631	-57.4		27	15,095	-66.7	
100	22	16,039	-58.2		24	16,168	-64.3		25	16,300	-66.3		14	16,280	-66.8		17	15,931	-56.1		18	16,042	-58.4		25	16,431	-71.6	
80	20	17,442	-58.7		21	17,530	-65.1		20	17,663	-68.1		14	17,620	-68.8		15	17,351	-56.7		17	17,441	-59.8		19	17,753	-72.8	
60	12	19,241	-59.3		13	19,292	-64.1		15	19,398	-66.5		10	19,348	-66.2		11	19,182	-57.1		12	19,237	-58.9		12	19,451	-69.3	
50	7	20,379	-58.6		10	20,408	-60.4		13	20,502	-64.7		8	20,449	-61.4		7	20,335	-57.5		7	20,378	-59.6		7	20,546	-64.1	
40	5	21,773	-58.8						9	21,888	-60.0						5	21,744	-57.8									

	BUFFALO, N. Y. (990 MB.)				BURRWOOD, LA (1017 MB.)				CAMAGUEY, CUBA (1004 MB)				CARIBOU, MAINE (0995 MB.)				CHARLESTON, S. C (1017 MB.)				CIUDAD VICTORIA, MEX. (972 MB.)				COLUMBIA, MO (986 MB)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	221	1.1	74	31	3	16.2	88	31	122	19.2	90	31	191	-4.5	77	31	13	12.4	76	20	335	26.0	42	30	239	3.6	68
1,000	31	137			31	147	17.8	75	31	153	19.6	87	31	153			31	155	13.7	66	20	85			30	119	-	
950	31	556	-0.1	69	31	590	15.4	68	31	602	18.5	80	31	561	-4.0	69	31	593	12.5	58	20	545	24.2		30	540	3.1	65
900	31	981	-1.9	66	31	1,042	12.8	62	31	1,059	17.0	62	31	983	-6.0	69	31	1,039	10.0	60	20	1,009	20.3		30	975	2.4	60
850	31	1,434	-3.3	61	31	1,521	11.2	50	31	1,546	14.9	57	31	1,430	-6.9	63	31	1,512	7.4	63	20	1,499	16.3		30	1,435	1.2	59
800	31	1,912	-4.8	55	31	2,026	10.0	39	31	2,057	12.6	46	31	1,902	-7.8	57	31	2,010	5.2	57	20	2,012	13.6		30	1,922	-0.3	53
750	31	2,425	-6.8	50	31	2,566	7.8	36	31	2,602	10.3	37	31	2,407	-9.4	53	31	2,545	3.3	46	20	2,564	11.6		30	2,442	-2.8	51
700	31	2,954	-9.2	47	31	3,126	4.9	33	31	3,168	7.2	38	31	2,933	-11.6	50	31	3,092	0.7	41	20	3,127	8.2		30	2,980	-5.2	50
650	30	3,536	-12.0	45	31	3,732	1.6	29	31	3,781	4.0	31	31	3,507	-14.1	43	30	3,689	-2.4	37	19	3,742	4.2		30	3,568	-8.7	47
600	30	4,137	-15.2	48	31	4;366	-2.7	30	31	4,422	0.4	23	31	4,103	-17.0	40	30	4,314	-5.9	33	18	4,381	-.4		30	4,176	-11.6	43
550	30	4,791	-19.1	44	31	5,053	-7.3	34	30	5,116	-4.0		31	4,755	-21.1	42	30	4,996	-10.1	34	18	5,074	-4.8		29	4,844	-15.3	40
500	30	5,492	-23.1	43	31	5,786	-12.2	34	30	5,860	-8.6		31	5,448	-25.8	40	30	5,718	-14.9	33	18	5,814	-10.3		28	5,553	-20.1	39
450	28	6,250	-28.6		31	6,594	-17.9	34	30	6,675	-13.9		31	6,206	-31.4	41	30	6,513	-20.1	37	16	6,618	-16.5		28	6,330	-25.7	
400	28	7,082	-34.4		31	7,455	-23.9	34	30	7,555	-20.2		31	7,027	-37.1		30	7,371	-26.1	40	15	7,484	-22.9		28	7,169	-31.8	
350	28	8,002	-40.9		31	8,415	-30.9		29	8,530	-27.8		31	7,938	-42.9		30	8,323	-33.3	43	14	8,452	-30.3		28	8,100	-37.8	
300	25	9,048	-47.2		31	9,490	-39.4		29	9,618	-36.5		31	8,963	-48.6		30	9,387	-41.7		12	9,514	-39.8		28	9,147	-45.0	
250	24	10,234	-52.8		31	10,713	-49.3		29	10,858	-45.8		31	10,148	-53.2		30	10,598	-50.8		[illegible]	10,735	-49.7		28	10,344	-52.5	
200	20	11,683	-55.0		31	12,144	-57.3		29	12,313	-55.2		29	11,583	-54.1		30	12,025	-57.2		7	12,174	-57.1		28	11,767	-57.1	
175	17	12,536	-54.1		31	12,983	-59.4		29	13,157	-59.6		28	12,443	-53.9		30	12,866	-58.6						28	12,612	-56.7	
150	10	13,449	-53.6		31	13,942	-62.2		29	14,112	-64.0		28	13,432	-54.1		26	13,831	-59.9						28	13,588	-56.9	
125	6	14,540	-52.9		30	15,062	-66.1		29	15,214	-69.6		25	14,599	-54.8		23	14,961	-63.3						28	14,735	-59.4	
100	6	15,973	-54.1		27	16,409	-71.1		29	16,524	-75.5		21	16,021	-55.9		22	16,320	-67.0						28	16,123	-61.5	
80	5	17,405	-56.3		24	17,729	-73.2		27	17,809	-76.9		18	17,443	-56.3		19	17,656	-68.0						27	17,501	-62.7	
60					15	19,412	-69.1		20	19,483	-70.9		11	19,249	-56.0		11	19,374	-64.9						23	19,271	-61.3	
50					11	20,507	-65.4		16	20,580	-64.6						6	20,505	-62.9						16	20,395	-60.0	
40					7	21,897	-61.3		11	21,970	-59.6						5	21,895	-56.3						8	21,806	-59.1	
30									8	23,793	-54.1																	

	DODGE CITY, KANS (923 MB.)				EL PASO, TEX. (879 MB)				ELY, NEV (806 MB.)				GLASGOW, MONT (941 MB.)				GRAND JUNCTION, COLO (849 MB)				GREAT FALLS, MONT (885 MB)				GREENSBORO, N C (985 MB)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	792	2.7	57	31	1,195	13.4	31	31	1,908	0.7	47	31	648	-10.4	75	31	1,474	4.5	42	31	1,128	-7.1	67	31	273	7.9	71
1,000	31	130			31	93			31	128			31	175			31	113			31	165			31	149		
950	31	556			31	539			31	559			31	581			31	550			31	578			31	575	8.8	52
900	31	994	4.1	47	31	1,001			31	1,006			31	992	-9.2	64	31	996			31	1,003			31	1,021	6.8	53
850	31	1,458	3.5	45	31	1,481	13.2	27	31	1,472			31	1,434	-8.9	59	31	1,464			31	1,446	-6.3	56	30	1,487	4.0	57
800	31	1,948	1.9	42	31	1,987	9.6	29	31	1,967			31	1,903	-9.1	56	31	1,960	3.9	33	31	1,919	-7.6	58	30	1,977	1.9	57
750	31	2,470	-0.7	39	31	2,524	6.0	32	31	2,491	-0.4	43	31	2,410	-10.9	56	31	2,485	-0.3	36	31	2,425	-9.4	61	30	2,504	0.1	51
700	31	3,014	-4.1	38	31	3,079	1.7	35	31	3,033	-4.5	48	31	2,928	-13.8	55	31	3,028	-4.7	40	31	2,950	-12.4	63	30	3,047	-2.2	40
650	31	3,598	-8.0	39	31	3,676	-2.7	37	31	3,616	-8.3	50	31	3,495	-16.8	55	31	3,612	-9.3	45	31	3,520	-16.2	62	30	3,636	-5.2	41
600	31	4,212	-11.5	38	31	4,301	-7.0	37	31	4,230	-12.0	45	30	4,085	-19.8	53	31	4,219	-13.8	49	31	4,110	-20.1	61	29	4,255	-8.7	38
550	31	4,877	-16.0		31	4,980	-11.4	35	30	4,890	-16.2	43	30	4,730	-24.0	54	31	4,882	-18.0	47	31	4,754	-23.9	58	29	4,928	-13.3	40
500	31	5,585	-20.7		30	5,694	-16.7		30	5,598	-21.1	[illegible]	30	5,414	-28.6	52	31	5,581	[illegible]	48	31	5,439	-28.4	56	29	5,643	-17.6	44
450	31	6,357	-26.0		30	6,483	-22.1		30	6,372	-26.3	34	30	6,165	-33.7	51	31	6,351	-28.2	48	31	6,191	-33.7	51	29	6,431	-22.4	42
400	31	7,198	-31.[illegible]		30	7,334	-27.8		30	7,209	-32.9		30	6,977	-39.4		31	7,181	-34.0	44	31	7,003	-39.1	49	29	7,281	-28.3	44
350	30	8,129	-38.0		30	8,280	-34.9		30	8,135	-39.6		30	7,881	[illegible]		31	8,103	-40.5		31	7,906	-45.3		29	8,225	-34.8	
300	29	9,177	-45.4		30	9,337	-42.9		30	9,174	-46.5		30	8,898	-50.5		30	9,133	-47.7		29	8,927	-51.2		29	9,283	-42.6	
250	28	10,364	-52.6		30	10,541	-52.4		28	10,357	-54.1		27	10,075	-54.2		30	10,317	-54.4		27	10,112	-55.6		29	10,492	-50.6	
200	24	11,786	-57.7		30	11,959	-58.6		28	11,770	-58.7		25	11,514	-55.1		27	11,724	-57.0		25	11,515	-56.6		28	11,932	-57.7	
175	22	12,630	-57.4		30	12,795	-58.9		27	12,604	-58.1		25	12,368	-53.6		27	12,569	-56.0		23	12,366	-55.1		27	12,767	-57.8	
150	22	13,603	-58.0		28	13,749	-60.2		27	13,577	-57.2		23	13,359	-53.2		27	13,547	-56.9		21	13,351	-54.6		27	13,737	-58.8	
125	22	14,746	-59.6		27	14,872	-62.8		27	14,727	-58.4		21	14,532	-54.1		26	14,696	-58.2		20	14,516	-55.3		26	14,875	-61.0	
100	20	16,113	-61.3		26	16,234	-66.1		26	16,122	-60.0		20	15,959	-54.8		26	16,094	-59.8		18	15,939	-56.0		24	16,267	-64.0	
80	19	17,496	-62.2		18	17,592	-66.7		21	17,509	-60.8		19	17,384	-54.7		24	17,478	-61.5		16	17,356	-57.0		18	17,625	-65.4	
60	15	19,269	-59.7		9	19,298	-63.6		13	19,220	-60.2		16	19,217	-55.9		18	19,254	-60.6		11	19,176	-56.9		11	19,389	-63.5	
50	11	20,400	-59.7						9	20,423	-58.1		10	20,377	-56.4		16	20,389	-59.2		5	20,308	-56.6		5	20,547	-61.7	
40	8	21,804	-58.3						5	21,861	-57.9		5	21,798	-55.4		7	21,785	-58.4									
30	7	23,628	-56.5																									

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

MARCH 1951

Standard pressure surface (mb)	HATTERAS, N C (1018 MB.)								HILO, T. H. (1011 MB.)				INTERNAT FALLS, MINN. (973 MB.)				JOLIET, ILL (993 MB.)				LAKE CHARLES, LA. (1016 MB.)				LANDER, WYO (825 MB)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	10.4	78					31	9	23.6	77	31	361	-8.7	78	31	179	0.7	78	31	5	15.1	81	31	1,696	-0.4	50
1,000	31	148	11.0	68					31	102	22.7	77	31	143			31	118			31	136	15.7	73	31	121		
950	31	582	8.9	63					31	548	19.3	79	31	548	-7.3	71	31	535	-0.3	69	31	573	13.8	69	31	547		
900	31	1,021	6.6	60					31	1,011	16.3	82	31	963	-9.3	68	31	962	-1.8	65	31	1,025	11.9	63	31	991		
850	31	1,489	4.3	55					31	1,495	13.0	83	31	1,404	-9.9	65	31	1,416	-2.4	59	31	1,503	10.3	52	31	1,450		
800	31	1,980	2.6	43					31	2,004	10.5	82	31	1,871	-10.7	58	31	1,896	-3.9	56	31	2,005	8.1	47	31	1,939	-0.1	43
750	31	2,509	0.8	37					31	2,544	8.2	72	31	2,374	-12.2	53	31	2,410	-5.4	52	31	2,543	6.6	35	31	2,457	-3.8	45
700	31	3,052	-1.9	38					31	3,108	5.2	67	31	2,892	-13.5	52	31	2,944	-7.8	51	31	3,100	3.3	36	31	2,992	-8.0	49
650	31	3,642	-5.0	36					31	3,714	2.2	54	31	3,463	-16.1	58	31	3,524	-11.0	53	31	3,701	-0.1	35	31	3,572	-12.0	52
600	31	4,262	-8.7	39					31	4,353	-1.3	45	31	4,052	-18.6	56	31	4,129	-14.3	51	31	4,333	-4.3	38	31	4,171	-15.7	49
550	31	4,935	-12.9	35					31	5,042	-5.7	41	31	4,700	-22.3	59	31	4,786	-17.6	49	31	5,015	-9.1	37	31	4,827	-20.0	45
500	31	5,652	-17.4	35					31	5,783	-10.3	42	31	5,389	-26.8	58	31	5,492	-22.2	46	31	5,742	-14.1	37	31	5,523	-24.4	41
450	31	6,437	-22.7	36					31	6,593	-15.6	40	31	6,142	-32.0	58	31	6,263	-27.7	43	31	6,538	-19.5	33	31	6,285	-30.1	42
400	31	7,288	-28.9	38					31	7,467	-21.2	43	31	6,963	-37.7	55	30	7,097	-33.2	42	31	7,399	-25.7	33	31	7,108	-36.3	
350	31	8,230	-35.3	40					31	8,439	-28.2	43	30	7,868	-44.2		30	8,022	-39.7		31	8,351	-32.9		31	8,021	-43.1	
300	31	9,285	-43.2						31	9,527	-36.0	44	30	8,885	-50.9		30	9,061	-46.5		31	9,417	-41.1		31	9,043	-49.8	
250	31	10,489	-51.7						31	10,769	-44.9		30	10,060	-54.6		29	10,253	-52.9		29	10,638	-50.7		30	10,222	-55.6	
200	31	11,912	-57.7						30	12,232	-54.5		26	11,481	-53.8		26	11,677	-56.8		29	12,063	-58.0		30	11,633	-57.8	
175	31	12,754	-58.0						27	13,078	-58.7		26	12,340	-52.7		25	12,532	-56.1		29	12,900	-59.7		29	12,472	-56.7	
150	30	13,716	-59.3						24	14,032	-63.3		26	13,334	-52.9		25	13,510	-56.6		29	13,857	-62.0		29	13,450	-56.0	
125	30	14,850	-62.0						18	15,155	-68.1		25	14,502	-53.4		22	14,670	-57.9		29	14,975	-65.0		29	14,607	-56.5	
100	28	16,216	-65.1						10	16,470	-72.4		22	15,928	-54.6		20	16,069	-59.3		27	16,327	-69.6		26	16,016	-57.9	
80	21	17,574	-65.5						8	17,762	-75.6		20	17,349	-55.2		15	17,460	-60.2		25	17,658	-71.8		22	17,432	-59.4	
60	13	19,344	-63.9						5	19,450	-70.6		11	19,151	-56.8		7	19,266	-59.8		22	19,364	-68.9		16	19,219	-58.4	
50	7	20,461	-62.5						5	20,542	-66.3		10	20,292	-57.4						20	20,463	-65.3		12	20,370	-58.0	
40									5	21,908	-61.1										13	21,860	-60.6		6	21,779	-56.4	
30									5	23,714	-56.0																	

Standard pressure surface (mb)	LAS VEGAS, NEV (936 MB)				LITTLE ROCK, ARK (1006 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE (970 MB.)				MERIDA, MEXICO (1011 MB)				MIAMI, FLA. (1018 MB.)				NANTUCKET, MASS (1015 MB)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	660	13.7	20	31	79	11.6	62	30	14	21.1	76	27	401	6.6	66	31	27	25.3	64	31	4	20.3	74	31	14	3.0	83
1,000	31	92			31	127	11.1	56	30	101	20.6	70	27	153			31	122	24.6	64	31	159	20.2	71	31	136	2.8	78
950	31	530			31	562	11.0	57	30	553	20.6	50	27	578	7.0	54	31	575	22.1	63	31	603	17.1	74	31	551	1.4	70
900	31	989	14.8		31	1,006	9.0	59	30	1,011	19.2	41	27	1,018	4.3	53	31	1,039	19.4	65	31	1,060	14.8	63	31	985	-0.3	68
850	31	1,469	11.0		31	1,477	6.8	57	30	1,500	16.5	37	27	1,481	1.3	58	31	1,528	16.3	65	31	1,542	13.0	48	31	1,441	-1.8	60
800	31	1,970	7.1		31	1,973	4.6	51	30	2,012	13.2	36	27	1,966	-2.0	61	31	2,043	14.3	51	31	2,051	11.8	32	31	1,922	-3.9	60
750	31	2,500	3.1	25	31	2,505	2.3	47	30	2,557	9.8	32	27	2,482	-5.3	60	31	2,593	11.5	44	31	2,596	9.1	31	31	2,434	-6.3	58
700	31	3,052	-0.7	29	31	3,052	-0.6	43	30	3,120	5.8	37	27	3,014	-8.4	54	31	3,159	8.6	37	31	3,156	6.0	31	31	2,966	-8.5	53
650	31	3,643	-4.6		31	3,646	-3.6	43	30	3,724	1.7	40	27	3,594	-11.3	48	31	3,775	5.1	30	31	3,768	2.8	29	30	3,543	-11.7	48
600	31	4,264	-9.1		30	4,267	-7.4	47	30	4,363	-2.3	37	26	4,192	-14.8	48	30	4,416	1.1		31	4,402	-1.2	31	30	4,141	-15.3	47
550	31	4,934	-13.6		29	4,950	-11.5	48	30	5,050	-6.6		26	4,851	-18.3	42	30	5,109	-3.6		30	5,094	-5.4	32	29	4,796	-19.5	43
500	31	5,650	-18.9		29	5,672	-16.2	45	30	5,786	-11.3		26	5,551	-22.6	39	30	5,855	-8.6		30	5,832	-10.1		29	5,493	-23.9	40
450	31	6,430	-24.4		29	6,459	-21.7	46	30	6,590	-16.9		26	6,317	-27.8	37	30	6,671	-14.1		30	6,645	-15.3		29	6,261	-28.7	42
400	31	7,275	-30.5		29	7,314	-28.0	50	29	7,466	-22.9	35	26	7,153	-33.7	35	30	7,548	-20.8		30	7,516	-21.7		29	7,089	-34.2	
350	31	8,210	-37.1		28	8,261	-34.6	50	29	8,430	30.2		26	8,076	-40.4		30	8,521	-28.0		30	8,485	-29.1		27	8,022	-40.3	
300	31	9,259	-44.7		28	9,321	-41.8		29	9,507	-38.6		25	9,123	-47.8		30	9,607	-36.6		30	9,567	-37.7		27	9,057	-47.0	
250	31	10,455	-53.3		27	10,545	-50.5		27	10,726	-48.5		23	10,307	-55.9		30	10,843	-46.1		29	10,795	-47.8		27	10,247	-53.0	
200	31	11,869	-59.3		25	11,971	-57.2		23	12,174	-57.5		21	11,693	-59.7		28	12,300	-55.7		29	12,237	-56.5		26	11,676	-56.0	
175	31	12,703	-59.7		24	12,820	-57.5		21	13,002	-60.7		20	12,516	-59.3		27	13,138	-61.0		25	13,074	-59.2		25	12,526	-56.0	
150	30	13,671	-58.6		24	13,790	-59.3		15	13,972	62.6		20	13,484	-58.3		21	14,079	-65.3		25	14,032	-62.7		25	13,504	-56.5	
125	29	14,813	-60.1		24	14,922	-62.5		9	15,062	-68.0		20	14,629	-59.0		18	15,176	-71.1		25	15,142	-67.5		25	14,656	-57.7	
100	29	16,196	-62.0		22	16,294	-65.7						20	16,024	-59.8		13	16,475	-77.3		24	16,472	-72.8		22	16,046	-58.0	
80	27	17,567	-63.5		17	17,629	-67.1						18	17,408	-60.9		6	17,752	-79.2		21	17,774	-75.1		21	17,444	-59.8	
60	22	19,338	-61.8		12	19,365	-65.0						15	19,196	-60.6						14	19,467	-70.9		17	19,242	-58.9	
50	21	20,471	-60.7		8	20,492	-63.2						12	20,333	-60.2						11	20,563	[illegible]		11	20,375	-58.5	
40	14	21,862	-59.4		5	21,837	-60.7						7	21,731	-60.0						9	21,933	-60.3					
30	7	23,666	-57.2																									

Standard pressure surface (mb)	NASHVILLE, TENN. (995 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1017 MB.)				OKLAHOMA CITY, OKLA. (969 MB.)				OMAHA, NEBR. (979 MB.)				PHOENIX, ARIZ (973 MB.)				PITTSBURGH, PA (970 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	177	9.2	73	31	849	-1.5	67	31	6	12.3	63	31	391	8.0	57	31	308	-0.8	76	31	338	16.8	31	30	382	3.6	66
1,000	31	133			31	137			31	146	12.2	61	31	123			31	139			31	97			30	135		
950	31	560	8.5	67	31	555			31	579	10.9	53	31	550	9.0	46	31	555	-0.8	65	31	542	18.5		30	556	3.8	59
900	31	1,005	6.7	63	31	989	-0.1	55	31	1,024	8.8	41	31	998	8.1	43	31	982	-1.7	61	31	999	15.2		30	992	2.0	59
850	31	1,472	4.6	60	31	1,445	-1.7	49	31	1,495	6.2	39	31	1,469	6.6	42	31	1,436	-2.5	60	31	1,479	11.5		30	1,452	-0.1	59
800	31	1,965	2.5	57	31	1,927	-2.7	48	31	1,989	3.9	32	31	1,964	4.3	40	31	1,916	-3.9	56	31	1,981	7.5	23	30	1,935	-2.4	58
750	31	2,488	0.3	54	31	2,443	-4.7	45	31	2,518	1.5	33	31	2,490	1.3	38	31	2,433	-5.5	51	31	2,515	3.7	25	30	2,449	-4.5	58
700	31	3,035	-2.3	54	31	2,976	-7.8	43	31	3,064	-1.4	30	31	3,038	-1.8	36	31	2,963	-7.6	51	31	3,065	0.1		30	2,986	-6.4	54
650	31	3,624	-5.5	50	31	3,558	-11.2	43	31	3,655	-5.0		31	3,628	-5.3	36	30	3,551	-10.7	47	31	3,660	-3.5		30	3,566	-9.3	47
600	31	4,243	-9.2	51	31	4,159	-14.7	41	31	4,274	-9.3		31	4,248	-9.3	33	29	4,145	-14.3	47	31	4,281	-8.0		29	4,178	-12.9	41
550	31	4,915	-13.1	50	31	4,819	-18.7	39	31	4,947	-13.6		31	4,919	-13.8	34	28	4,807	-18.5	40	31	4,955	-12		29	4,639	-16.8	41
500	31	5,631	-17.5	45	31	5,517	-23.3	38	31	5,660	-18.3		31	5,632	-18.5		28	5,504	-23.3		31	5,673	-17.4		29	5,545	-21.4	41
450	31	6,415	-22.8	42	31	6,285	-28.5	40	31	6,442	-24.1		31	6,414	-23.3		28	6,269	-28.6		31	6,455	-23.1		29	6,319	-26.5	38
400	31	7,267	-28.4	43	31	7,114	-34.6		31	7,286	-30.4	33	31	7,263	-29.3		27	7,100	-34.4		31	7,305	-29.4		29	7,155	-32.6	38
350	31	8,209	-35.4	45	31	8,033	-41.1		31	8,221	-37.7		30	8,212	-35.9		27	8,022	-40.6		31	8,244	-36.4		29	8,082	-39.1	
300	31	9,265	-43.1		30	9,065	-47.8		31	9,267	-45.6		29	9,259	-43.7		27	9,056	-47.5		27	9,311	-44.6		29	9,124	-45.6	
250	29	10,476	-51.1		29	10,246	-54.4		29	10,462	-53.9		29	10,463	-51.7		27	10,245	-53.2		27	10,507	-53.4		29	10,319	-52.7	
200	28	11,909	-57.1		28	11,666	-56.9		28	11,868	-61.1		21	11,906	-56.5		26	11,670	-56.2		22	11,913	-59.0		27	11,748	-55.5	
175	28	12,754	-57.2		28	12,513	-56.0		27	12,692	-61.1		19	12,747	-57.2		26	12,519	-55.7		13	12,764	-58.9		27	12,597	-55.7	
150	27	13,723	-58.8		28	13,494	-55.6		27	13,652	-59.7		19	13,720	-58.1		26	13,502	-55.8		12	13,735	-59.6		24	13,582	-56.7	
125	23	14,864	-61.4		25	14,651	-57.5		27	14,791	-60.0		17	14,878	-61.5		25	14,665	-57.5		8	14,869	-60.9		23	14,739	-58.4	
100	14	16,139	-63.6		24	16,060	-58.8		25	16,174	-62.2		16	16,256	-63.8		22	16,059	-59.1		6	16,219	-63.9		21	16,145	-61.6	
80	9	17,545	-65.5		22	17,452	-60.0		22	17,545	-62.8		13	17,610	-65.5		19	17,455	-60.0						19	17,525	-61.3	
60					19	19,248	-60.6		16	19,319	-61.1		8	19,364	-66.1		15	19,256	-60.9						11	19,312	-60.6	
50					17	20,379	-59.8		15	20,440	-60.7		7	20,480	-64.1		8	20,417	-59.6						10	20,463	-60.2	
40					11	21,775	-58.6		9	21,821	-58.8														6	21,867	-59.5	
30									5	23,627	-56.9																	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

MARCH 1951

Standard pressure surface (mb.)	PORTLAND, MAINE. (1016 MB.)				RAPID CITY, S. DAK (904 MB)				ST CLOUD, MINN. (978 MB.)				SAN ANTONIO, TEX. (987 MB.)				SAN JUAN, P R. (1015 MB)				SANTA MARIA, CALIF (1008 MB)				S STE MARIE, MICH. (988 MB)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	20	- 0.3	82	31	[illegible]	- 6.3	66	31	317	- 7.5	79	30	240	16.3	58	31	19	22.9	73	31	71	10.7	75	31	221	- 3.6	77
1,000	31	144	0.3	74	31	162			31	138			30	123			31	146	22.0	72	31	141	11.2	69	31	123		
950	31	557	- 0.8	68	31	572			31	547	- 6.8	73	30	565	15.8	54	31	593	18.4	78	31	577	11.2	56	31	532	- 3.8	71
900	31	[illegible]	- 3.0	68	31	1,000			31	961	- 7.1	[illegible]	30	1,020	13.7	54	31	1,052	15.1	79	31	1,022	11.1	33	31	954	- 5.7	70
850	31	1,436	- 4.0	63	31	1,451	- 3.9	52	31	1,406	- 7.5	63	30	1,500	11.6	55	31	1,534	12.6	72	31	1,496	8.4	39	31	1,401	- 6.8	70
800	30	1,916	- 5.6	62	31	1,929	- 5.1	50	31	1,878	- 8.3	63	30	2,00	9.5	46	31	2,042	11.1	54	31	1,995	5.6	37	31	1,873	8.1	61
750	30	2,428	- 7.5	55	31	2,437	- 7.7	49	31	2,385	-10.0	60	30	2,543	7.4	39	31	2,590	9.9	38	31	2,529	3.3	27	31	2,381	- 9.7	56
700	30	2,955	- 9.9	54	31	2,967	-10.5	49	31	2,907	-11.8	59	29	3,105	4.9	35	31	3,151	8.1	25	31	3,076	0.4	25	31	2,904	-11.4	57
650	30	3,530	-12.9	50	31	3,538	-13.8	45	31	3,484	-14.0	56	27	3,710	1.0	35	29	3,765	5.4		31	3,672	- 3.1		31	3,477	-14.6	56
600	30	4,131	-16.1	51	31	4,137	-17.5	45	31	4,076	-16.9	56	27	4,343	- 3.4	38	29	4,408	2.0		31	4,296	- 7.4		31	4,071	-17.7	57
550	30	4,781	-20.0	50	31	4,787	-21.7	42	31	4,732	-20.7	55	27	5,028	- 7.8	36	29	5,104	- 1.7		31	4,970	-12.0		31	4,724	-21.3	54
500	30	5,480	-24.9	47	31	5,479	-25.9	42	31	5,423	-25.2	52	26	5,706	-12.7	36	29	5,855	- 6.7		31	5,691	-17.0	27	31	5,414	-25.9	52
450	30	6,240	-30.2	46	31	6,234	-31.1	42	31	6,183	-30.3	50	25	6,567	-18.6	38	28	6,679	-11.9		31	6,472	-22.9		31	6,173	-31.0	52
400	30	7,067	-35.7		31	7,060	-36.8		31	7,008	-36.3	49	25	7,431	-25.2	40	28	7,563	-18.6		31	7,326	-29.2		31	6,996	-36.7	54
350	30	7,983	-41.7		31	7,972	-43.0		31	7,921	-43.1		25	8,388	-32.0		28	8,544	-26.4		31	8,265	-36.3		31	7,909	-42.3	
300	29	9,012	-48.0		30	9,001	-49.6		31	8,945	-49.4		24	9,459	-40.2		28	9,637	-35.3		31	9,318	-44.0		31	8,936	-48.5	
250	28	10,194	-53.6		30	10,178	-54.8		31	10,126	-53.9		23	10,685	-49.5		28	10,882	-44.4		29	10,515	-53.0		31	10,120	-53.8	
200	28	11,618	-55.2		26	11,601	-55.7		30	11,556	-55.0		23	12,115	-58.1		28	12,344	-54.3		23	11,904	-59.8		27	11,537	-54.7	
175	28	12,470	-54.7		21	12,455	-55.2		[illegible]	12,418	-54.2		23	12,951	-59.9		26	13,189	-59.2		18	12,721	-59.7		25	12,383	-54.0	
150	26	13,466	-55.8		16	13,432	-55.9		29	13,407	-54.1		22	13,919	-61.6		25	14,140	-64.5		16	13,693	-58.8		24	13,368	-53.6	
125	24	14,621	-56.6		13	14,571	-55.4		27	14,581	-54.9		20	15,031	-64.7		23	15,238	-69.9		16	14,832	-60.7		21	14,525	-54.5	
100	22	16,034	-58.2		12	15,991	-56.9		26	15,996	-56.1		20	16,379	-68.6		23	16,544	-75.9		16	16,214	-62.6		17	15,926	-55.2	
80	19	17,426	-58.7		10	17,393	-58.0		23	17,401	-57.1		20	17,707	-70.5		21	17,813	-79.4		16	17,585	-63.8		12	17,333	-56.1	
60	14	19,231	-59.1						7	19,239	-58.0		12	19,429	-67.4		16	19,465	-73.6		11	19,335	-63.2		6	19,158	-57.5	
50	7	20,334	-59.0										9	20,505	-65.4		11	20,536	-68.0		8	20,453	-61.4					
40																	8	21,885	-61.2									

Standard pressure surface (mb.)	SPOKANE, WASH. (931 MB.)				SWAN ISLAND, W. I. (1014 MB.)				TACUBAYA, MEXICO (772 MB.)				TAMPA, FLA. (1018 MB.)				TATOOSH ISLAND, WASH. (1012 MB.)				TOLEDO, OHIO (991 MB)				WASHINGTON, D C. (1007 MB)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	28	712	1.3	72	31	10	24.5	79	28	2,306	16.6	43	31	9	18.2	78	31	31	4.4	80	28	191	2.0	79	31	88	5.8	68
1,000	28	136			31	131	23.8	80	28	39			31	160	18.2	72	31	131			20	115			31	146		
950	28	556			31	585	20.4	85	28	505			31	600	16.4	63	31	549	1.7	72	28	532	2.0	71	31	566	4.8	[illegible]
900	28	991	1.2	62	31	1,044	17.6	78	28	984			31	1,058	14.4	60	31	981	- 1.0	71	28	985	0.1	69	31	1,005	2.4	61
850	28	1,448	- 1.5	60	31	1,531	15.4	64	28	1,475			31	1,539	12.0	52	31	1,435	- 3.7	58	28	1,422	- 1.1	58	31	1,465	0.5	[illegible]
800	28	1,928	- 4.7	60	31	2,044	13.5	48	28	2,006			31	2,045	10.0	39	31	1,911	- 6.1	65	28	1,904	- 2.7	54	31	1,950	- 1.3	56
750	28	2,438	- 7.8	58	31	2,593	11.5	34	28	2,559	15.2	40	31	2,583	7.7	33	31	2,418	- 8.7	61	28	2,421	- 4.8	50	31	2,466	- 3.6	50
700	28	2,966	-11.1	53	31	3,159	9.0		28	3,135	10.9	43	31	3,144	5.1		31	2,946	-11.7	59	28	2,954	- 7.1	46	31	3,005	- 6.0	47
650	28	3,538	-14.7	51	31	3,778	6.1		28	3,753	6.1	48	31	3,750	1.7	31	31	3,516	-14.8	56	28	3,539	-10.0	46	31	3,589	- 8.7	44
600	28	4,133	-18.6	52	31	4,421	2.4		28	4,399	1.0	53	31	4,386	- 2.4	33	31	4,111	-18.3	56	28	4,141	-13.9	46	31	4,199	-12.2	44
550	28	4,779	-23.0	46	31	5,118	- 1.9		28	5,097	- 4.1	55	31	5,069	- 6.8	35	31	4,758	-22.5	54	28	4,807	-17.4	43	31	4,865	-16.2	43
500	28	5,468	-27.6	48	31	5,869	- 6.4		28	5,838	- 9.1	45	31	5,808	-11.6	36	31	5,449	-27.1	54	28	5,507	-21.6	45	31	5,570	-20.8	41
450	28	6,221	-32.8	51	31	6,688	-11.8		28	6,655	-14.0		30	6,609	-16.9		31	6,203	-31.6	56	28	6,279	-26.9	43	31	6,348	-25.6	
400	28	7,037	-38.6		31	7,576	-18.4		26	7,529	-20.0		30	7,479	-23.1		31	7,025	-37.1	56	28	7,115	-32.8	43	31	7,185	-31.6	
350	27	7,931	-44.5		31	8,557	-25.9		24	8,503	-27.9		30	8,442	-30.5		31	7,938	-42.5		28	8,042	-39.3		31	8,115	-38.6	
300	27	8,950	-49.8		30	9,654	-34.4		23	9,590	-36.7		30	9,519	-39.0		30	8,970	-48.0		28	9,082	-46.3		31	9,158	-45.5	
250	[illegible]	10,127	-53.8		30	10,902	-44.0		16	10,838	-46.4		30	10,742	-48.8		30	10,156	-53.7		25	10,278	-53.2		30	10,355	-52.8	
200	25	11,541	-56.1		29	12,363	-54.6		14	12,297	-55.4		30	12,176	-57.0		28	11,567	-58.6		20	11,702	-55.9		30	11,779	-56.8	
175	23	12,391	-55.0		29	13,207	-59.8		11	13,139	-59.4		28	13,009	-59.0		27	12,401	-57.6		18	12,560	-56.4		29	12,629	-57.6	
150	23	13,377	-54.2		29	14,157	-65.2		11	14,090	-65.5		27	13,960	-61.9		26	13,389	-56.2		17	13,540	-56.4		25	13,601	-58.0	
125	23	14,545	-54.8		27	15,255	-71.3		8	15,214	-71.0		26	15,084	-66.4		24	14,542	-57.0		15	14,708	-58.5		24	14,749	-60.3	
100	21	15,971	-55.7		25	16,553	-77.3		5	16,516	-78.5		25	16,419	-71.5		19	15,948	-57.1		15	16,102	-60.3		23	16,137	-63.0	
80	18	17,398	-56.6		21	17,821	-78.6						22	17,733	-73.8		16	17,370	-57.9		13	17,502	-62.2		19	17,500	-63.5	
60	16	19,213	-56.8		17	19,486	-72.7						20	19,428	-69.4		8	19,209	-59.4		7	19,246	-60.5		11	19,280	-62.5	
50	9	20,396	-57.6		12	20,555	-68.8						12	20,538	-66.5		5	20,318	-60.8						7	20,384	-61.2	
40					12	21,906	-62.9						9	21,899	-60.7													
30					8	23,686	-56.7						5	23,703	-55.0													

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21 MARCH 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	273	2.7	31	252	2.3	29	248	1.7	27	330	3.0	30	315	4.0	31	12	0.6	31	131	5.3	27	237	3.8	31	315	0.2	31	226	2.3	28	239	2.4	31	252	4.8
500	--	---	----	--	---	----	29	238	2.2	--	---	----	--	---	----	--	---	----	28	152	5.2	27	243	4.5	31	224	1.4	31	243	3.0	28	223	2.7	--	---	----
1,000	31	249	2.9	--	---	----	26	230	3.7	--	---	----	29	319	5.0	31	233	.2	18	177	4.9	19	236	4.4	26	217	4.4	27	262	4.0	24	222	3.9	--	---	----
1,500	30	251	4.3	--	---	----	22	252	5.7	27	280	3.7	25	313	6.9	31	257	2.4	15	195	3.7	16	232	6.1	13	222	5.7	23	276	7.2	21	241	7.0	31	250	5.2
2,000	29	251	6.9	31	255	4.0	20	276	8.1	26	261	6.2	22	305	7.6	30	270	4.3	13	232	3.9	10	228	4.2	13	291	3.6	21	276	10.6	18	264	9.5	31	252	5.0
2,500	28	246	10.1	31	260	5.3	16	285	10.7	24	264	8.2	18	311	10.5	22	294	5.6	12	245	6.1				12	285	5.0	18	271	13.0	16	271	12.7	30	257	6.3
3,000	25	255	11.9	29	273	7.0	13	277	14.9	23	273	9.7	18	305	11.8	16	283	6.5	11	245	8.2				11	281	6.7	17	273	14.7	15	230	16.4	29	266	9.9
4,000	25	261	17.0	25	286	11.2	11	275	20.7	16	282	11.7	18	301	13.9	11	286	8.3	11	256	9.5				11	287	9.3	14	279	21.3	11	275	21.5	27	263	13.9
5,000	20	265	19.6	22	231	15.7	11	273	24.9	12	279	14.7	16	293	13.4	10	304	11.9	10	263	11.1				10	235	9.7	10	280	23.9				24	265	18.6
6,000	15	272	20.8	21	276	17.8				11	286	15.9	11	311	13.0				10	253	14.7													21	264	18.4
8,000				17	279	21.7																												17	268	21.5
10,000				12	288	25.3																												13	277	23.4

Altitude (meters) m.s.l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	29	310	2.1	31	293	2.7	28	262	2.6	27	300	1.2	31	113	0.7	28	241	3.3	31	42	0.8	30	277	1.4	29	292	0.9	31	137	2.8	28	220	2.6	27	235	2.0
500	--	---	----	--	---	----	28	256	3.1	--	---	----	30	231	1.8	27	244	3.3	--	---	----	30	257	3.2	29	277	1.2	31	141	3.0	25	240	3.7	27	234	3.7
1,000	--	---	----	--	---	----	27	247	4.4	27	231	2.4	29	257	4.9	21	214	4.2	31	13	.7	25	239	5.3	29	248	1.6	29	156	1.3	22	253	4.6	23	249	5.5
1,500	--	---	----	31	291	2.7	26	262	7.4	24	273	5.9	23	259	6.3	19	236	6.5	30	233	1.4	19	240	7.7	27	225	2.6	23	234	1.9	19	273	5.6	20	250	6.7
2,000	29	313	2.3	31	281	3.0	20	277	11.2	21	273	8.9	20	260	8.8	15	266	7.5	30	297	3.0	17	259	10.4	24	292	1.4	27	262	3.1	14	232	8.6	18	267	9.7
2,500	29	304	3.5	31	263	4.0	19	232	14.0	13	273	8.6	18	261	11.6	15	282	10.3	29	290	4.8	15	266	12.5	21	332	3.3	25	231	4.1	10	288	10.5	15	276	12.5
3,000	27	292	5.2	29	261	5.2	17	233	16.8	14	239	9.3	17	259	12.6	14	279	14.7	29	287	6.1	15	272	14.3	21	325	4.9	24	283	5.3				15	277	15.2
4,000	26	309	8.9	23	269	8.0	14	236	20.6	11	236	10.0	13	266	14.3	13	286	20.4	28	299	9.5	12	275	13.5	16	329	9.1	16	297	8.1				12	274	18.9
5,000	20	317	14.0	21	275	12.1	12	282	25.2							12	233	21.6	25	303	10.8	11	272	23.7	11	316	11.2	15	295	8.3				10	276	23.8
6,000	20	315	19.0	17	291	14.5													24	309	12.1				11	317	12.2	15	291	10.7						
8,000	16	319	18.6	13	324	16.4													18	304	16.7				10	305	17.4	12	273	18.0						
10,000	14	317	23.0																																	
12,000	10	323	25.4																																	

Altitude (meters) m.s.l.	New York, N.Y. (15 m.)			Oakland, Calif. (3 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (313 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	27	296	2.2	30	272	3.2	30	273	3.2	27	322	3.4	31	261	1.0	30	355	5.0	27	325	2.5	23	259	1.6	29	161	1.1	31	267	3.4	23	305	1.7	26	243	3.4
500	27	281	3.6	30	300	3.0	29	271	3.2	27	321	3.2	31	259	2.0	--	---	--	27	338	3.3	23	235	2.9	29	167	1.6	31	279	2.6	23	312	1.8	26	229	3.6
1,000	24	293	6.0	29	335	2.9	28	259	4.1	20	257	1.8	31	260	2.1	30	355	4.9	23	326	4.9	20	241	6.8	27	184	1.2	29	307	.9	21	47	.8	25	225	5.6
1,500	20	303	7.5	23	335	3.6	26	245	7.5	15	242	5.2	31	254	2.2	30	321	4.8	20	327	3.5	17	257	10.8	25	228	1.9	28	358	.9	17	96	1.1	22	223	5.3
2,000	14	301	8.4	26	328	5.0	27	248	10.6	15	251	8.7	31	254	3.5	28	303	6.1	19	297	5.6	16	257	12.7	24	243	4.0	26	339	2.5	13	72	3.5	20	248	5.2
2,500	12	310	9.3	25	329	6.7	25	252	12.3	14	262	12.7	30	265	4.2	27	302	7.3	18	286	8.0	15	264	13.3	21	252	6.2	25	320	2.9	12	69	1.4	18	263	6.7
3,000	12	308	10.4	25	321	7.8	24	262	14.9	14	269	13.4	30	280	4.9	25	299	9.8	17	292	8.4	14	272	15.7	19	250	7.7	25	315	3.5	11	343	2.2	12	265	6.1
4,000				25	324	10.1	18	264	20.5	12	263	14.3	28	284	9.9	19	303	12.0	12	293	12.7	10	274	23.3	17	251	13.0	22	304	5.6						
5,000				19	321	13.0	14	269	23.3	10	284	16.7	25	283	11.5	18	293	13.6	11	286	14.5				17	255	16.6	21	301	8.6						
6,000				18	317	14.8	11	272	24.0				20	237	13.0	11	278	14.1							10	266	18.0	21	302	9.5						
8,000				11	304	13.6							12	283	19.4													19	289	10.6						
10,000																												12	289	13.3						

Altitude (meters) m.s.l.	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	24	234	3.3	26	264	2.0
500	--	---	----	26	264	4.3
1,000	21	236	4.3	25	266	5.9
1,500	21	242	5.7	24	269	7.4
2,000	22	253	6.7	20	287	10.0
2,500	20	255	7.6	20	290	12.6
3,000	17	259	9.0	18	292	14.9
4,000	13	260	8.6	17	293	17.6
5,000	10	233	8.6	14	296	22.0
6,000				11	305	30.8

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn.		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	286	0.2	31	161	1.9	31	300	2.1	31	123	3.8	29	156	0.4	31	319	1.5	31	212	1.2	30	337	1.3	31	110	0.4	31	312	0.4	31	333	0.5	31	333	1.0
500	--	---	----	--	---	----	--	---	----	31	147	7.4	28	206	2.5	31	341	1.2	31	244	4.3	30	262	1.5	--	---	----	31	253	2.1	29	286	2.7	31	358	1.9
1,000	--	---	----	31	188	3.2	31	313	5.6	31	162	6.5	28	223	2.9	31	4	1.5	31	258	6.3	30	245	5.0	--	---	----	31	255	5.6	28	285	5.1	31	4	1.5
1,500	--	---	----	29	238	4.8	31	314	7.0	31	182	5.2	27	249	4.1	31	17	.6	31	277	7.4	30	255	7.4	31	104	.4	30	264	8.2	28	285	6.9	30	345	2.1
2,000	31	232	4.9	28	260	7.3	31	306	8.5	31	217	4.3	26	253	6.0	31	232	1.4	31	278	9.8	30	263	9.6	31	259	1.7	29	267	8.9	29	278	9.2	29	311	4.6
2,500	31	273	7.6	26	263	10.7	31	302	8.7	31	229	5.8	26	259	9.0	31	218	2.3	31	274	12.5	30	268	11.4	31	260	3.9	27	272	10.8	29	278	11.3	29	301	4.8
3,000	31	282	9.2	25	267	13.3	31	297	9.0	31	242	6.8	27	254	11.2	31	229	3.7	31	274	14.6	30	267	12.6	31	262	5.7	27	269	12.4	28	284	14.0	28	293	4.5
4,000	31	277	12.2	24	267	13.3	31	287	10.2	31	253	10.4	27	260	14.7	31	246	4.9	28	273	17.4	28	263	14.8	30	276	8.5	27	274	16.3	27	281	17.5	26	284	6.5
5,000	28	282	14.0	21	277	19.7	31	288	11.9	31	255	13.3	25	262	16.6	31	247	7.6	24	280	19.2	27	264	18.4	30	286	10.4	26	275	19.9	25	282	21.5	26	283	7.1
6,000	27	232	16.8	17	266	23.2	30	272	12.2	28	253	15.2	23	268	18.4	30	239	6.7	21	283	21.7	23	263	16.5	29	291	13.1	24	278	23.3	23	281	22.8	26	275	9.1
8,000	18	293	17.2	11	268	27.8	23	268	13.5	24	258	20.0	19	265	24.0	28	270	7.2	17	287	30.0	19	271	19.1	19	310	11.3	20	281	29.5	15	291	23.3	23	251	9.3
10,000	12	300	21.2				18	264	17.0	23	254	27.0	15	271	28.7	27	280	8.4	11	286	38.3	13	257	19.7	11	302	13.4	12	280	32.6				19	269	19.0
12,000							12	280	9.7	15	253	27.7	10	265	31.7	23	238	10.0				10	263	17.9										14	261	15.4
14,000										12	258	23.3				21	288	10.2																12	263	14.2
16,000										11	245	17.6				17	300	7.9																		
18,000																10	259	4.3																		

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
Surface	31	311	0.3	31	331	2.3	32	117	1.3	29	2	0.9	31	220	1.2	31	279	2.2	31	47	1.3	31	2	2.5	31	104	2.7	31	82	2.7	31	336	1.9	31	309	1.4
500	31	245	3.6	31	323	2.3	32	146	1.9	27	299	3.4	31	213	3.7	31	308	4.2	27	33	.9	--	---	----	31	119	4.5	31	49	5.9	30	328	3.2	31	352	3.8
1,000	31	249	5.6	31	297	2.6	32	151	1.4	26	297	4.6	31	239	8.0	31	321	3.9	26	259	3.1	31	2	2.6	31	153	3.5	31	49	5.2	30	345	4.1	31	346	4.7
1,500	29	259	7.8	30	269	3.6	32	228	2.0	26	293	5.0	30	254	9.4	31	324	3.9	26	255	8.2	31	325	3.4	31	204	3.7	31	42	4.7	30	315	4.4	31	342	4.8
2,000	29	267	9.9	30	262	5.0	32	241	3.1	26	290	5.2	30	259	11.4	31	317	4.6	24	259	10.7	31	305	6.0	31	237	4.9	31	32	4.4	30	303	5.9	31	333	5.3
2,500	28	267	12.4	29	282	5.6	31	258	4.7	24	283	7.4	30	264	12.8	31	315	5.4	24	261	12.2	31	306	8.6	31	259	7.2	31	6	3.7	30	294	6.2	31	319	6.3
3,000	28	271	14.6	29	297	9.5	31	271	5.6	23	237	7.5	29	263	13.9	31	314	8.2	22	267	14.5	31	303	11.6	30	253	9.3	30	356	3.6	30	283	7.3	31	312	8.0
4,000	26	265	19.2	27	305	11.4	31	277	8.0	24	280	11.0	29	267	16.3	31	307	11.7	23	267	17.1	31	295	14.1	26	256	13.5	29	332	4.8	31	277	10.0	31	307	9.4
5,000	22	264	23.7	26	307	16.2	30	280	9.9	24	232	15.0	27	272	19.4	31	308	14.9	24	263	18.4	31	291	16.3	25	260	15.5	29	312	6.5	31	271	12.3	31	307	11.8
6,000	19	263	25.7	18	291	18.4	30	280	13.2	22	291	18.0	23	276	23.3	29	309	16.9	24	261	20.2	29	289	17.0	24	254	16.5	29	302	8.3	31	265	14.1	29	297	13.4
8,000	12	267	28.1	11	295	21.5	27	290	18.0	17	278	20.2	15	253	27.9	19	293	12.3	18	259	27.7	23	270	22.2	21	251	24.0	23	302	13.8	27	255	16.1	26	306	14.3
10,000							25	235	22.8	10	296	20.0				13	312	15.1	12	260	31.3	15	267	21.2	17	254	27.1	23	296	19.0	23	257	15.6	23	300	14.6
12,000							24	237	28.2	10	287	28.6				10	324	19.9										26	234	26.2	18	244	13.4			
14,000							16	282	26.0																			21	236	26.9	16	254	12.1			
16,000							12	301	21.5																			14	301	15.8	15	250	9.2			
18,000																												14	306	9.4	10	274	5.2			

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
Surface	30	3	0.6	29	211	1.9	31	289	1.3
500	30	20	.5	--	---	----	30	232	1.3
1,000	29	200	.4	29	226	4.2	30	214	3.2
1,500	26	266	2.3	29	238	5.9	30	227	4.9
2,000	25	281	3.4	29	250	6.1	28	247	6.4
2,500	25	280	3.6	27	259	6.2	27	254	7.3
3,000	25	266	4.0	26	264	6.6	27	262	8.3
4,000	21	279	2.6	26	273	9.2	26	274	9.5
5,000	19	290	4.7	26	276	11.8	24	271	11.0
6,000	17	294	4.9	26	281	15.2	23	279	15.4
8,000	13	299	6.2	22	280	20.8	18	280	21.3
10,000							12	289	24.1

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30.--Solar radiation intensities, tabulated in langleys per minute.

TABLE MOUNTAIN, CALIF.

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a. m.	1:30 p. m.
Air mass	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
March										*Mb.*	*Mb.*
6	----	----	----	1.46	----	----	----	----	----		
25	----	----	----	1.47	----	----	----	----	----		
Averages	----	----	----	1.46	----	----	----	----	----		
Departures	----	----	----	-.01	----	----	----	----	----		

LINCOLN, NEBR.

Date	A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
March										*Mb.*	*Mb.*
6	----	----	----	1.00	1.22	1.09	0.87	0.72	0.60	2.1	2.1
7	0.72	0.78	0.92	1.06	1.18	----	----	----	----	1.8	2.6
20	----	----	----	----	1.52	1.31	1.15	1.00	----	2.0	1.7
21	.80	.92	1.06	1.24	1.41	----	----	----	----	1.7	3.2
Averages	.76	.85	.99	1.10	1.33	1.20	1.01	.86	.60		
Departures	-.06	-.08	-.09	-.17	-.15	-.06	-.06	-.07	-.21		

MADISON, WIS.

Date	A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
March										*Mb.*	*Mb.*
1	0.71	0.81	0.99	1.16	----	1.11	----	----	----	2.6	3.3
5	.45	.55	.75	1.04	----	----	----	----	----	3.8	6.1
7	.87	1.01	1.14	1.30	----	----	----	----	----	2.7	2.9
9	.83	.96	1.08	1.26	----	----	----	----	----	1.0	2.2
16	----	----	----	1.31	----	1.30	----	----	----	2.2	3.7
19	.59	.76	.96	1.11	----	----	----	----	----	1.9	2.1
20	.83	.90	1.07	1.28	----	----	----	----	----	1.4	1.7
21	.70	.86	1.03	1.18	----	1.28	----	----	----	1.5	1.9
24	.83	.96	1.11	1.26	----	----	----	----	----	1.9	2.6
Averages	.73	.85	1.02	1.21	----	1.23	----	----	----		
Departures	-.07	-.09	-.07	-.06	----	-.05	----	----	----		

BOSTON, MASS.

Date	A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
March										*Mb.*	*Mb.*
6	0.69	0.78	0.83	1.04	----	----	----	----	----	3.5	5.6
26	----	.70	.97	1.17	----	----	----	----	----	2.6	2.1
27	----	----	----	----	----	1.16	0.83	----	----	2.0	2.9
28	----	.31	.46	.72	----	----	----	----	----	5.6	7.8
Averages	.69	.60	.75	.98	----	1.16	.83	----	----		
Departures	+.02	-.13	-.13	-.11	----	+.01	-.17	----	----		

*Extrapolated

TACUBAYA, D. F., MEXICO

Date	Sun's zenith distance A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T. 7:30 a. m.	1:30 p. m.
Air mass	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
March										*Mb.*	*Mb.*
1	----	0.36	0.56	----	----	0.62	0.50	0.30	0.21	7.7	7.6
2	----	----	----	0.80	----	----	----	----	----	9.1	8.0
3	----	----	.60	----	----	----	----	----	----	9.1	9.1
5	----	----	.69	----	----	----	----	----	----	9.1	8.4
6	----	----	.50	----	----	----	.41	----	----	9.4	7.7
8	----	----	----	----	----	.54	.29	.18	.12	6.1	5.6
9	----	----	.53	----	----	----	----	----	----	6.3	5.2
10	----	----	----	----	----	.69	.40	.30	----	6.8	7.2
12	----	----	.39	.61	----	----	----	----	----	9.1	8.5
14	----	----	.71	.97	----	----	----	----	----	7.7	6.9
26	----	----	----	1.08	----	1.06	.88	.79	.71	8.3	8.5
27	0.59	----	----	.56	----	1.07	.98	.86	.73	8.0	6.4
28	----	----	----	1.04	----	1.09	.75	.79	.74	8.7	6.3
29	----	----	.79	.85	----	----	----	----	----	6.0	5.7
30	----	----	----	.88	----	.92	.75	.60	.48	7.3	7.2
31	----	----	.83	1.18	----	.72	.67	.57	.51	5.4	4.7
Averages	.59	.36	.62	.89	----	.84	.63	.55	.50		
Departures	----	----	----	----	----	----	----	----	----		

BLUE HILL, MASS.

Date	A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
March										*Mb.*	*Mb.*
2	----	----	----	1.06	----	----	----	----	----	3.8	3.8
5	----	----	----	----	----	----	0.94	----	0.67	6.0	5.9
6	0.82	0.93	1.06	----	----	----	----	----	----	3.0	3.4
10	----	----	----	1.22	----	----	----	----	----	1.7	2.0
12	----	----	----	----	----	1.27	1.13	1.02	.92	4.7	5.0
25	.89	1.02	1.15	1.32	----	1.34	1.18	.99	.92	2.2	2.4
26	.90	.97	----	----	----	----	1.21	----	----	2.5	1.9
27	----	----	----	----	----	1.23	1.00	.79	.62	2.0	1.6
28	----	.38	.50	.71	----	----	----	----	----	5.3	4.8
Averages	.87	.83	.90	1.08	----	1.28	1.09	.93	.78		
Departures	-.01	-.14	-.19	-.16	----	+.04	+.03	-.02	-.06		

RATIO BOSTON/BLUE HILL ON COMPARABLE DATES

	0.84	0.79	0.83	1.01	----	0.94	0.83	----	----		

ALBUQUERQUE, N.M.

Date	A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
March										*Mb.*	*Mb.*
26					CLOUDY						
27					CLOUDY						
28					CLOUDY						
29	0.87	1.02	1.19	1.38	1.62	----	----	1.02	----	2.4	1.9
30					CLOUDY						
31	.70	.91	1.11	1.33	1.49	----	----	----	----	4.0	2.9
Averages	.79	.97	1.15	1.36	1.56	----	----	1.02	----		
Departures	-.17	-.10	-.02	+.04	-.03	----	----	-.12	----		

NO RECORD BEFORE THE 26TH BECAUSE OF EQUATORIAL MOUNTING FAILURE

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

MARCH 1951

able 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	26	27	28	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	429	246	46	32	323	96	27	171	293	439	246	285	156	443	50	273	328	40	24	83	160	66	169	124
Date	19	20	21	22	23	24	25	Average	26	27	28	29	30	31	1	Average								
Langleys	64	141	158	72	196	145	490	181	461	479	367	114	97	99	399	288								

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	26	27	28	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	63	45	29	36	88	67	20	50	81	65	76	89	96	84	39	76	67	50	22	57	70	50	83	57
Date	19	20	21	22	23	24	25	Average	26	27	28	29	30	31	1	Average								
Langleys	71	52	105	58	106	75	76	77	92	80	82	90	85	65	82	82								

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	26	27	28	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	100	87	61	57	144	143	38	90	182	97	175	189	169	142	81	148	109	101	38	118	158	78	138	106
Date	19	20	21	22	23	24	25	Average	26	27	28	29	30	31	1	Average								
Langleys	138	71	218	82	181	178	64	133	128	68	143	160	147	94	113	122								

Note.–Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.-Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. MARCH 1951

	Aklavik, MacKenzie	Albuquerque, N. Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Bethel, Alaska	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Is., Pac.Area	Charleston, S.C.	Cleveland, Ohio	Columbus, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Inyokern, Calif.	Ithaca, N.Y.	Keflavik, Iceland
1951																																
February 26	49	501	240	416	411	177	369	---	325	368	699	388	61	98	157	54	319	206	(195)	84	484	215	395	380		390	456		502	527	170	108
February 27	59	476	174	513	164	63	232	---	197	399	(681)	463	66	424	382	97	203	230	169	115	284	291	463	228		350	133		516	548	47	122
February 28	159	506	162	433	302	191	76	309	110	540	684	429	200	141	81	158	88	258	380	89	328	376	422	346		246	424		434	539	118	40
March 1	107	260	66	297	276	141	62	267	57	512	(729)	422	438	423	280	341	---	256	229	190	332	271	458	412		371	271		422	330	---	75
March 2	125	395	274	482	484	196	330	254	(356)	546	721	405	263	176	479	107	313	343	306	202	332	387	405	375		141	507		445	559	242	99
March 3	78	225	279	484	396	210	177	245	172	174	707	443	82	119	280	40	191	221	448	240	249	473	471	395		342	365		428	553	32	---
March 4	167	518	57	495	60	138	38	120	27	260	722	309	311	256	59	349	56	295	418	204	550	115	467	377		55	91		216	153	208	---
Averages	106	412	179	446	299	159	183	239	(178)	400	(706)	408	203	234	246	164	195	258	(307)	161	366	304	440	359		271	321		423	459	136	89
Departures	-16	+13	-50	+3	---	-11	-100	-11	-51	---	---	---	---	---	-58	-53	-69	-15	---	+30	+62	-45	+61	+12		---	---		+28	---	-78	---
March 5	194	551	445	489	215	196	320	296	306	334	717	165	408	401	234	348	186	161	437	204	378	353	306	270		105	229		126	423	432	---
March 6	177	570	373	238	70	233	403	176	370	490	726	391	401	377	151	272	419	348	240	215	(434)	259	471	447		359	73		287	558	405	---
March 7	164	537	123	349	---	252	292	249	256	586	658	175	409	359	343	363	282	354	(390)	216	469	455	315	347		389	186		534	546	82	---
March 8	208	292	163	441	488	229	361	225	290	599	729	520	423	313	277	111	352	397	334	211	(250)	426	351	447		377	463		630	492	281	---
March 9	161	331	242	518	518	284	226	337	191	613	741	517	271	449	511	358	144	316	304	238	(236)	417	483	319		500	531		533	524	269	---
March 10	226	226	483	471	358	288	453	386	392	522	726	378	454	437	463	352	392	421	487	216	326	519	471	471		497	407		548	600	400	181
March 11	248	469	337	381	131	285	93	461	86	434	712	62	490	365	489	346	115	407	502	242	(190)	507	259	458		449	155		260	591	272	204
Averages	197	425	309	412	297	252	307	304	270	511	716	315	408	386	352	307	270	343	(385)	220	(326)	420	379	394		382	292		417	533	306	---
Departures	+17	-33	+55	-10	---	+23	+11	+10	+9	---	---	---	---	---	+3	+48	-6	+26	---	+67	-64	+21	+27	+11		---	---		-12	---	+49	---
March 12	144	592	499	389	60	324	353	251	328	266	494	86	442	327	478	210	229	329	481	200	(603)	520	333	418		284	36		187	615	320	180
March 13	210	563	113	85	204	325	109	372	131	670	704	196	48	47	492	37	126	414	468	215	(643)	502	206	264		55	186		103	611	401	214
March 14	171	584	43	444	175	242	42	343	29	235	621	362	86	153	497	53	63	268	480	(271)	(494)	506	433	345		244	198		591	594	---	227
March 15	198	555	77	553	332	186	155	124	172	(335)	567	547	(188)	119	409	154	347	158	362	281	570	496	---	362		318	351		582	522	99	165
March 16	264	504	193	573	570	219	265	312	230	439	727	591	203	201	493	185	225	307	521	281	(529)	557	---	368		358	578		454	594	44	135
March 17	276	613	140	547	431	213	128	400	124	502	718	532	233	337	534	345	166	386	555	282	314	535	---	414		531	466		635	614	111	228
March 18	274	562	479	318	70	252	275	491	211	149	703	248	141	72	508	83	275	391	601	144	637	545	---	510		287	41		662	625	293	220
Averages	220	568	220	416	263	252	190	328	175	(371)	648	366	(192)	179	487	152	204	322	495	(239)	(541)	523	---	383		297	265		459	596	211	196
Departures	+1	+36	-40	-7	---	-11	-118	-12	-116	---	---	---	---	---	+109	-98	-90	-10	---	+40	+48	+106	---	-16		---	---		+19	---	-40	---
March 19	151	610	153	45	73	326	157	486	276	599	704	137	62	87	444	67	243	248	587	165	630	508	235	425		65	63		569	607	299	219
March 20	139	595	316	238	467	174	167	426	152	210	700	564	556	545	479	321	135	283	527	96	631	474	228	493		446	557		416	511	475	122
March 21	279	607	322	577	597	332	274	212	260	670	710	264	519	391	398	182	219	340	375	278	607	482	367	411		439	624		117	552	51	272
March 22	182	362	311	618	617	305	91	430	95	679	703	620	419	455	539	255	86	289	600	195	606	577	623	341		565	636		637	621	405	185
March 23	301	630	259	612	528	251	284	436	175	448	645	535	(349)	272	530	61	418	442	611	286	451	577	617	373		493	592		322	635	146	248
March 24	315	622	178	466	572	412	257	518	197	130	730	354	141	268	501	204	154	386	615	233	502	580	514	541		478	597		587	637	200	236
March 25	298	549	494	571	590	283	578	285	548	122	716	595	375	477	499	366	537	400	599	221	507	526	601	458		542	614		337	618	357	300
Averages	238	568	290	447	492	297	258	399	243	408	701	438	(346)	356	484	208	256	341	559	211	562	532	455	435		433	526		426	597	276	226
Departures	-9	+25	+2	-1	---	-2	-106	+12	-58	---	---	---	---	---	+92	-67	-69	-4	---	-16	+25	+82	-5	-10		---	---		-12	---	-22	---
March 26	264	462	531	546	613	427	531	446	481	(305)	694	625	471	594	556	468	501	286	467	280	139	593	634	523		561	629		179	614	484	303
March 27	281	208	562	352	233	439	574	519	496	387	706	621	398	357	563	236	546	467	652	320	254	590	496	475		506	271		247	642	502	88
March 28	228	424	417	357	68	333	460	534	413	623	691	376	97	67	426	44	471	426	650	269	635	555	422	556		162	81		482	649	232	304
March 29	262	667	42	203	244	397	193	181	149	651	693	284	256	279	363	87	233	440	329	(365)	675	292	304	564		152	219		484	268	135	252
March 30	311	418	57	669	668	299	178	250	180	678	690	513	213	168	579	134	210	309	148	399	646	660	440	522		374	703		555	671	70	180
March 31	364	520	367	667	650	309	131	502	137	421	602	677	188	462	576	71	347	507	490	375	592	645	697	532		590	676		471	655	149	340
April 1	324	582	489	585	---	239	537	521	529	532	719	651	49	55	524	131	527	193	610	317	429	631	635	521		546	653		652	675	284	343
Averages	291	469	352	483	413	349	372	422	341	(514)	685	535	239	283	512	167	405	375	478	(332)	482	567	518	528		413	462		439	596	265	259
Departures	-10	-45	+12	-18	---	+10	-20	+14	-21	---	---	---	---	---	+29	-111	+27	+7	---	+41	-42	+83	+46	+40		---	---		-40	---	-41	---
Accumulated Departures January 1 to April 1, 1951																																
	-217	-63	---	+7	---	-56	-3150	-133	-1820	---	---	---	---	---	-966	-3304	-2597	00	---	+1183	---	+2884	+2723	---		---	---		-490	---	-2177	---

**Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.**

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.(Cont'd.) MARCH 1951

	Lake Charles, La.	Las Vegas, Nev.	Lincoln, Nebr.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T.H.	Put-in-Bay, Ohio	Rapid City, S.D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	Santa Maria, Calif.	Sault Ste.Marie, Mich	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle (U. of W.), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Toronto, Ont.	Upton, N.Y.	Wake Island, Pacific Area	Washington, D.C.	Winnipeg, Manitoba
1951																																
February 26---	(372)	447	427	326	127	331	103	335	225	314	288	150	499	117	379	---	85	167	152		310	130	327	325	346	254	448	75	294	---	354	79
February 27---	342	439	336	178	294	338	293	287	338	371	205	98	428	108	68	---	376	283	457		357	71	442	322	402	368	420	31	349	606	448	320
February 28---	329	488	109	112	69	385	184	94	187	310	(121)	360	420	217	420	---	65	277	384		269	331	385	252	367	185	425	45	248	481	310	253
March 1---	496	140	318	63	426	294	473	56	38	347	392	71	383	447	501	---	452	287	315		45	49	56	322	204	38	400	118	43	585	71	206
March 2---	396	332	6	294	95	340	364	280	359	367	326	242	446	274	159	---	144	64	532		(298)	265	347	363	313	352	323	259	280	508	(376)	373
March 3---	329	512	383	211	108	107	129	259	40	56	154	189	415	99	410	497	309	240	533		76	132	56	33	162	14	443	14	95	467	51	309
March 4---	262	244	435	36	412	299	78	42	39	139	58	257	258	396	455	470	337	449	393		32	53	81	119	285	138	448	258	24	470	99	316
Averages------	(361)	372	288	174	219	299	232	193	175	272	(221)	195	407	237	346	---	253	253	395		(198)	147	242	248	297	193	416	114	191	519	(244)	265
Departures----	-17	-40	-14	-30	-51	+24	-42	-87	-80	---	-24	-63	+21	+1	+11	---	+10	-42	-26		-55	---	-53	---	-9	-42	---	-80	-43	---	-36	+28
March 5---	364	450	418	339	389	156	392	312	419	199	273	427	194	456	371	223	378	217	267		455	353	444	212	305	301	444	280	(425)	605	428	206
March 6---	210	512	437	352	339	197	84	435	319	281	209	281	305	402	344	303	287	244	263		467	335	443	240	238	305	166	247	(452)	611	(393)	241
March 7---	455	501	431	222	364	169	---	327	149	240	284	250	378	459	---	475	229	346	530		187	56	275	(186)	455	71	492	315	191	639	250	267
March 8---	416	435	476	291	292	262	450	357	278	146	463	461	467	368	364	462	514	348	498		340	271	444	86	252	382	37	180	329	516	321	336
March 9---	418	422	194	192	458	314	472	262	288	344	480	471	535	452	401	279	457	170	532		308	237	333	272	391	300	37	385	356	423	347	372
March 10---	480	533	34	361	265	464	84	429	474	331	183	496	611	454	342	428	135	482	566		503	417	520	257	488	495	72	443	464	522	527	129
March 11---	200	551	170	---	104	304	69	194	298	82	31	326	294	492	490	518	254	480	559		338	200	445	131	376	434	106	363	(217)	583	536	404
Averages------	363	486	309	293	316	266	258	331	318	232	275	387	398	441	385	384	322	327	459		371	267	415	(198)	358	327	193	316	(348)	557	(400)	279
Departures----	-13	+13	-10	+57	+17	-41	-21	+28	+40	-20	+42	+57	-24	+134	-9	-34	+2	+30	-12		+60	---	+69	---	+28	+46	---	+56	+55	---	+85	-22
March 12---	280	554	430	337	111	202	24	251	403	43	33	478	242	422	468	530	407	426	568		511	429	441	80	186	418	343	426	(477)	641	347	442
March 13---	610	538	324	115	99	492	227	159	66	266	91	481	159	69	468	523	373	188	562		75	379	141	159	181	81	534	264	88	599	64	435
March 14---	593	551	410	50	221	469	91	53	131	105	185	274	624	87	495	527	422	403	574		224	34	123	132	156	91	515	36	(192)	547	59	348
March 15---	567	503	420	201	434	157	80	500	147	328	49	171	570	172	420	502	541	253	558		240	128	337	439	214	102	465	130	(184)	570	304	453
March 16---	(459)	548	234	220	501	438	488	273	219	250	354	220	187	352	---	494	455	430	533		259	104	315	355	448	172	292	135	(250)	529	271	280
March 17---	279	574	54	120	226	528	266	245	296	464	255	280	664	439	398	527	304	300	593		306	160	386	381	509	152	183	216	385	562	450	343
March 18---	140	578	526	236	74	502	130	381	458	442	147	547	650	149	498	565	184	529	603		499	317	444	414	450	396	552	410	405	618	208	357
Averages------	(418)	549	343	183	238	398	187	266	246	271	159	350	485	241	458	524	384	361	570		302	222	313	280	306	202	412	231	---	581	245	380
Departures----	+3	+18	+5	-12	-78	+19	-88	-53	-37	+4	-96	-10	+41	-62	+14	+118	-12	-25	+28		-33	--	-45	---	-35	-66	-	-52	---	---	-76	+15
March 19---	418	574	527	300	410	356	170	255	117	336	54	128	561	82	427	543	516	459	579		266	265	152	403	492	33	559	8	187	458	69	279
March 20---	224	481	576	144	511	491	475	230	472	124	452	377	394	528	542	490	521	466	571		473	323	547	302	386	458	415	197	444	572	564	424
March 21---	594	568	532	248	553	384	196	221	284	277	367	182	163	440	484	417	558	425	(449)		238	172	324	261	333	111	567	346	229	655	381	442
March 22---	622	432	502	107	413	556	519	117	447	246	575	547	468	378	378	528	424	282	601		424	326	435	199	358	501	496	410	430	637	557	456
March 23---	463	526	161	132	34	544	214	434	409	465	378	251	380	200	552	413	372	551	602		494	197	513	270	318	391	483	228	464	604	484	448
March 24---	503	604	548	210	561	476	519	183	243	455	610	112	561	189	---	539	595	550	613		127	139	326	342	449	270	522	80	125	645	416	472
March 25---	388	596	555	531	442	363	463	561	188	154	548	570	319	549	474	551	458	476	560		527	324	135	57	419	436	534	362	502	619	395	428
Averages------	459	540	486	239	418	453	365	286	351	294	426	352	406	338	476	497	492	459	(568)		361	249	390	262	394	314	511	233	340	598	409	421
Departures----	+34	-4	+103	-12	+87	+10	+24	-98	+22	-4	+82	-15	-51	+16	-1	+93	+70	+77	-5		+7	-	+21	---	+14	+4	---	-20	00	---	+67	+11
March 26---	91	540	473	460	486	568	585	559	573	227	611	622	444	529	500	412	432	381	596		588	467	599	128	503	582	270	523	550	578	598	303
March 27---	231	619	32	508	133	582	71	576	(496)	535	161	346	344	378	399	546	153	345	603		562	458	549	447	570	478	601	300	558	654	557	514
March 28---	65	611	40	394	69	339	56	461	341	264	138	389	533	114	---	508	343	594	561		151	365	279	372	398	158	334	134	444	617	128	433
March 29---	492	306	345	198	135	329	314	169	49	294	382	186	657	252	---	395	537	315	412		36	47	125	307	321	27	424	31	41	654	146	414
March 30---	653	488	337	201	75	324	496	171	25	214	296	133	527	174	613	289	164	199	643		60	57	90	200	358	21	613	42	77	650	138	357
March 31---	466	621	355	119	107	621	490	409	569	329	559	246	565	243	541	596	212	150	655		535	229	566	367	374	485	470	212	583	664	532	374
April 1---	557	627	307	518	229	513	229	503	402	161	404	397	645	133	444	590	399	563	626		552	367	474	444	443	95	451	154	522	616	352	526
Averages------	365	545	270	343	176	468	320	407	(351)	332	364	331	531	260	499	477	320	364	586		398	284	383	324	424	264	452	199	396	633	350	417
Departures----	-64	-17	-107	+18	-174	+30	-34	+17	+19	+8	-53	00	+29	-78	+31	+60	-53	-34	+15		+15	---	-12	--	+12	-87	---	-86	+22	---	-7	-11

Accumulated Departures January 1 to April 1, 1951

	Lake Charles, La.	Las Vegas, Nev.	Lincoln, Nebr.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T.H.	Put-in-Bay, Ohio	Rapid City, S.D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	Santa Maria, Calif.	Sault Ste.Marie, Mich	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle (U. of W.), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Toronto, Ont.	Upton, N.Y.	Wake Island, Pacific Area	Washington, D.C.	Winnipeg, Manitoba
	-56	-210	+119	-336	-1645	+119	-336	-2408	+28	--	654	427	-147	--	+273	+1036	-329	+105	+98		-132	---	-238	---	+98	-840	--	1064	-70	---	+539	-189

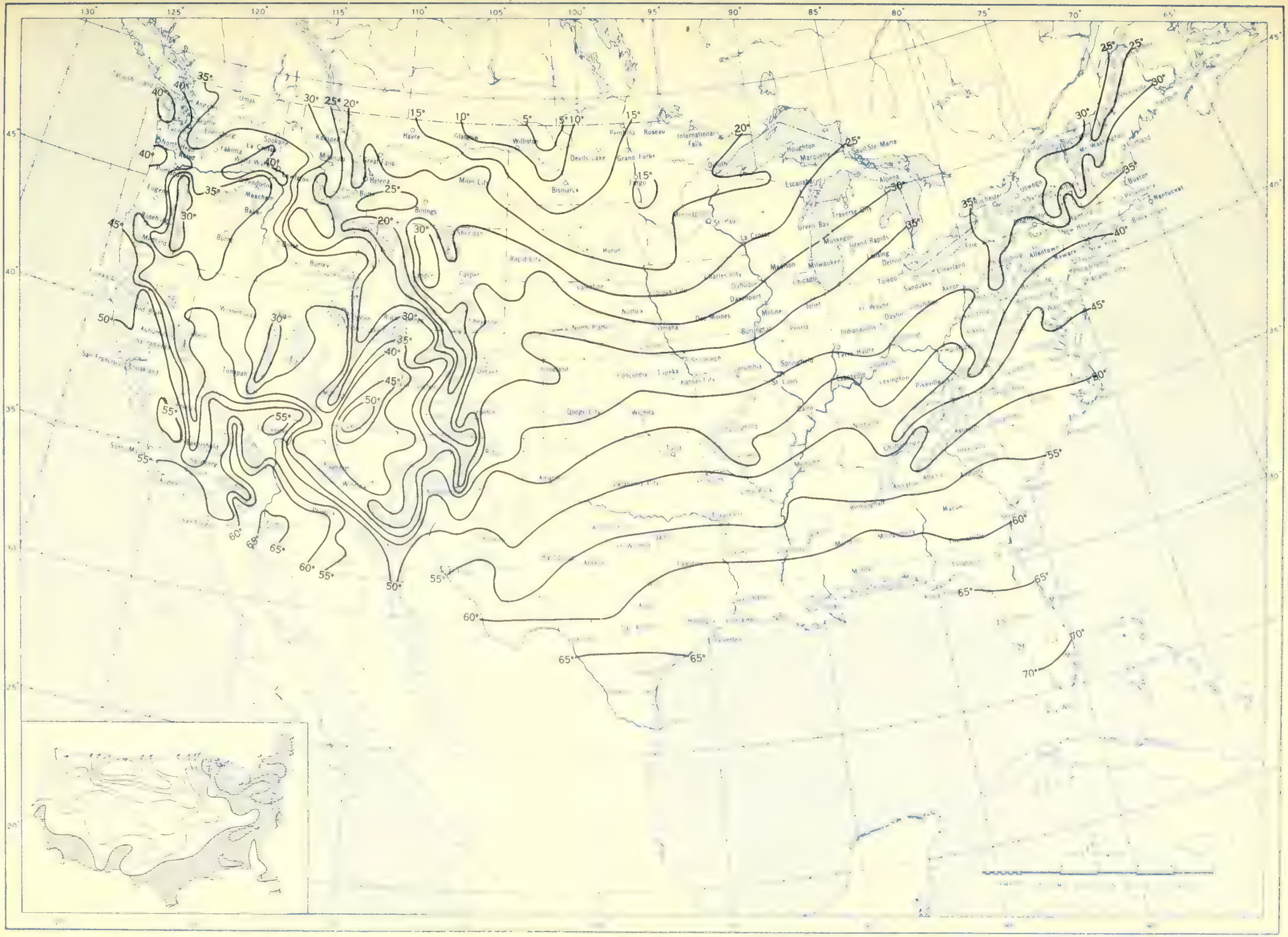
Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

Beginning with this issue, five new stations are being added to Table 33 and will appear regularly in future issues. Following is a list of these stations, together with a brief description of each:

1. Bethel, Alaska: Latitude 60° 47'N; longitude 161° 41'W; elevation 8 meters. Excellent exposure - no obstructions to horizon. Equipment located at Weather Bureau Office.
2. Columbus, Ohio: Latitude 40° 00'N; longitude 83° 01'W; elevation 232 meters, Leeds & Northrup Micromax recorder. Excellent exposure no obstructions to horizon; severe atmospheric pollution with easterly winds bringing smoke from industrial section of city and with northerly winds bringing smoke from local heating plant. Program sponsored by Ohio State University and is under the supervision of Prof. Kennard S. Nelson, College of Agriculture. Pyrheliometer located on greenhouse in college yard.
3. Greensboro, N. C.: Latitude 36° 05'N; longitude 79° 57'W; elevation 280 meters. Brown integrating potentiometer. Some shading from many wire poles; slight smoke pollution of atmosphere from trains and nearby hangar. Equipment located at Weather Bureau Office.
4. Keflavik, Iceland: Latitude 63° 57'N; longitude 22° 37'W; elevation 50 meters. Excellent exposure - no obstructions to horizon. Equipment located at Weather Bureau Office.
5. Wake Island, Pacific Area: Latitude 19° 17'N; longitude 166° 39'E; elevation 8 meters. Very good exposure although some slight shading of diffuse radiation is caused by nearby buildings. Equipment located at Weather Bureau Office.

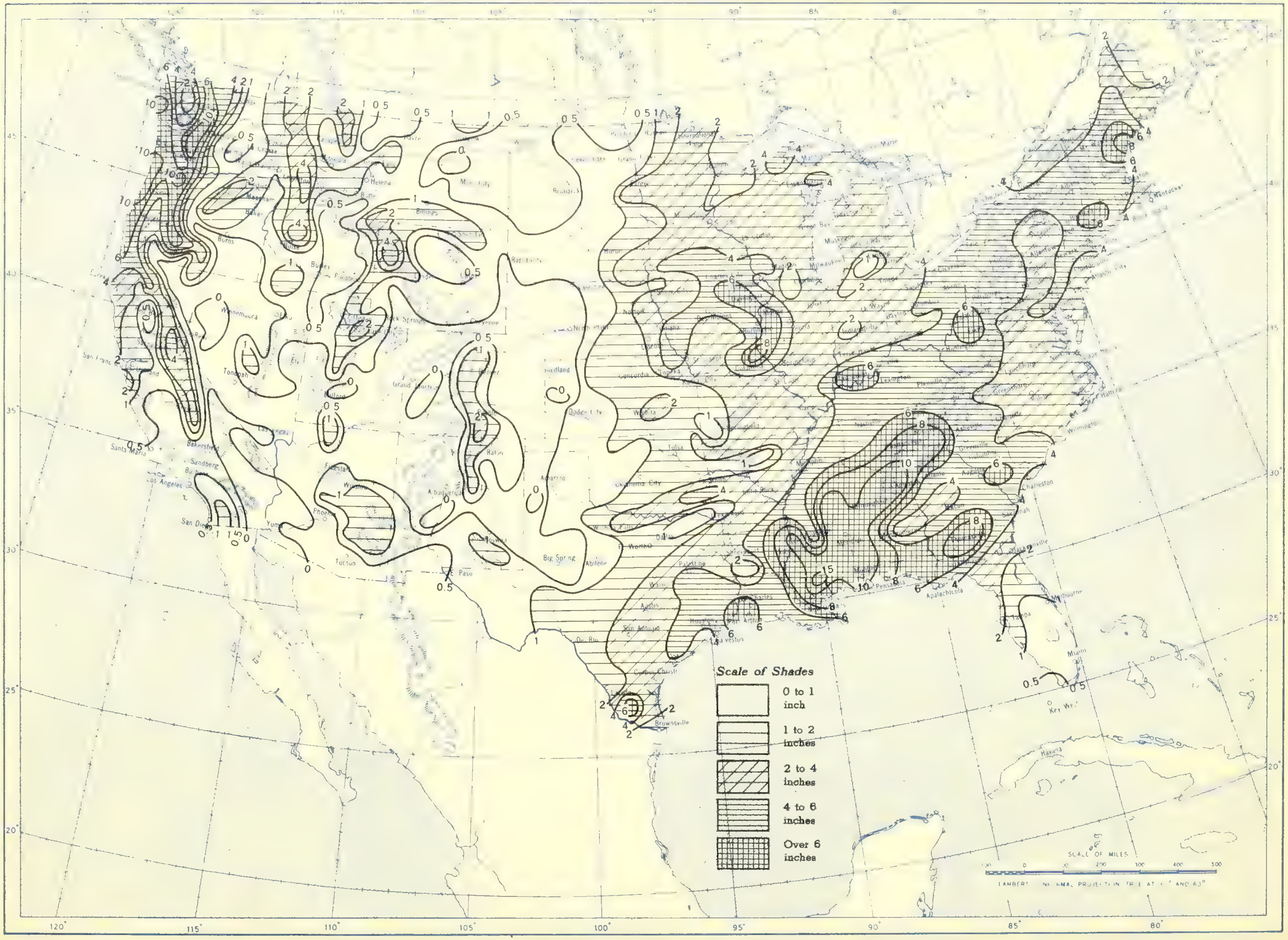
W.B.T.U., New Orleans, Louisiana --- 7/27/51 --- 2200

Chart I. Average Temperature (°F.) at Surface, March 1951. Inset: Departure of Average Temperature from Normal (°F.), March 1951.



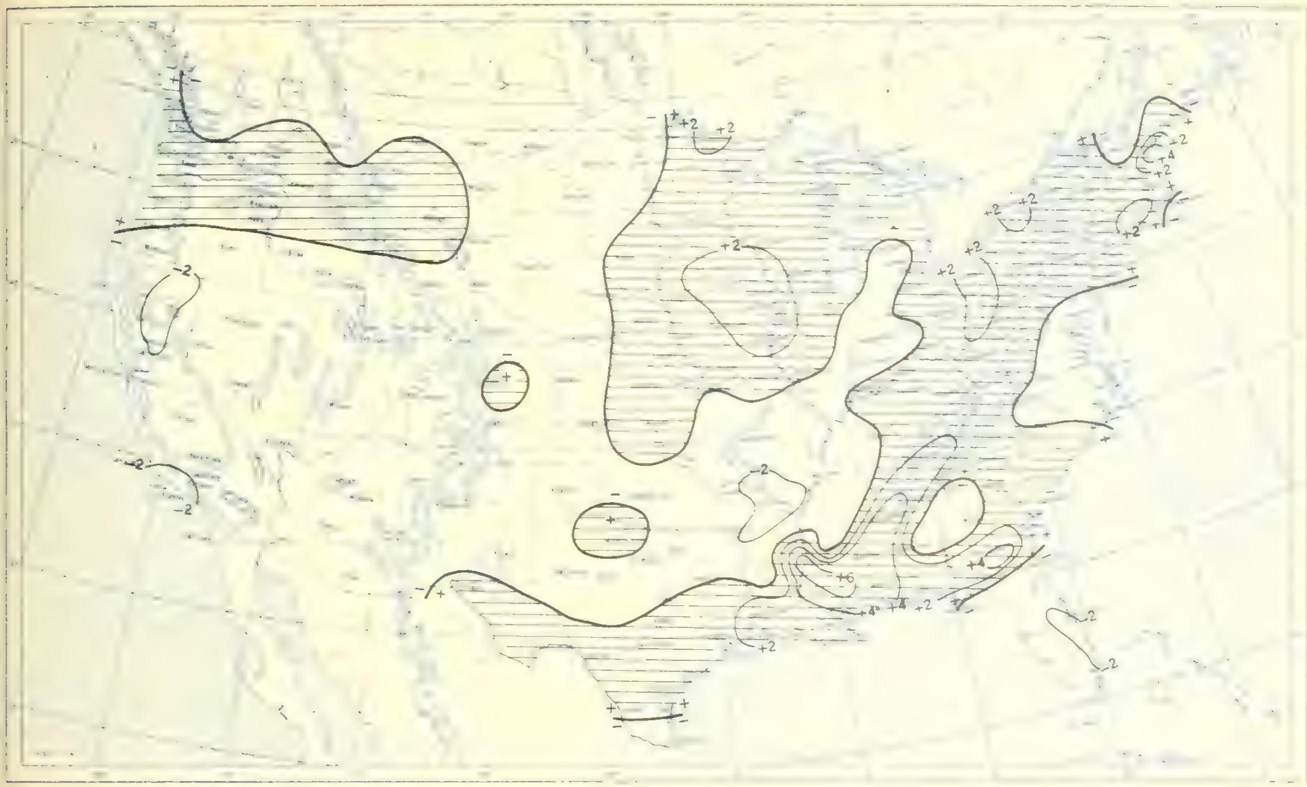
Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), March 1951.

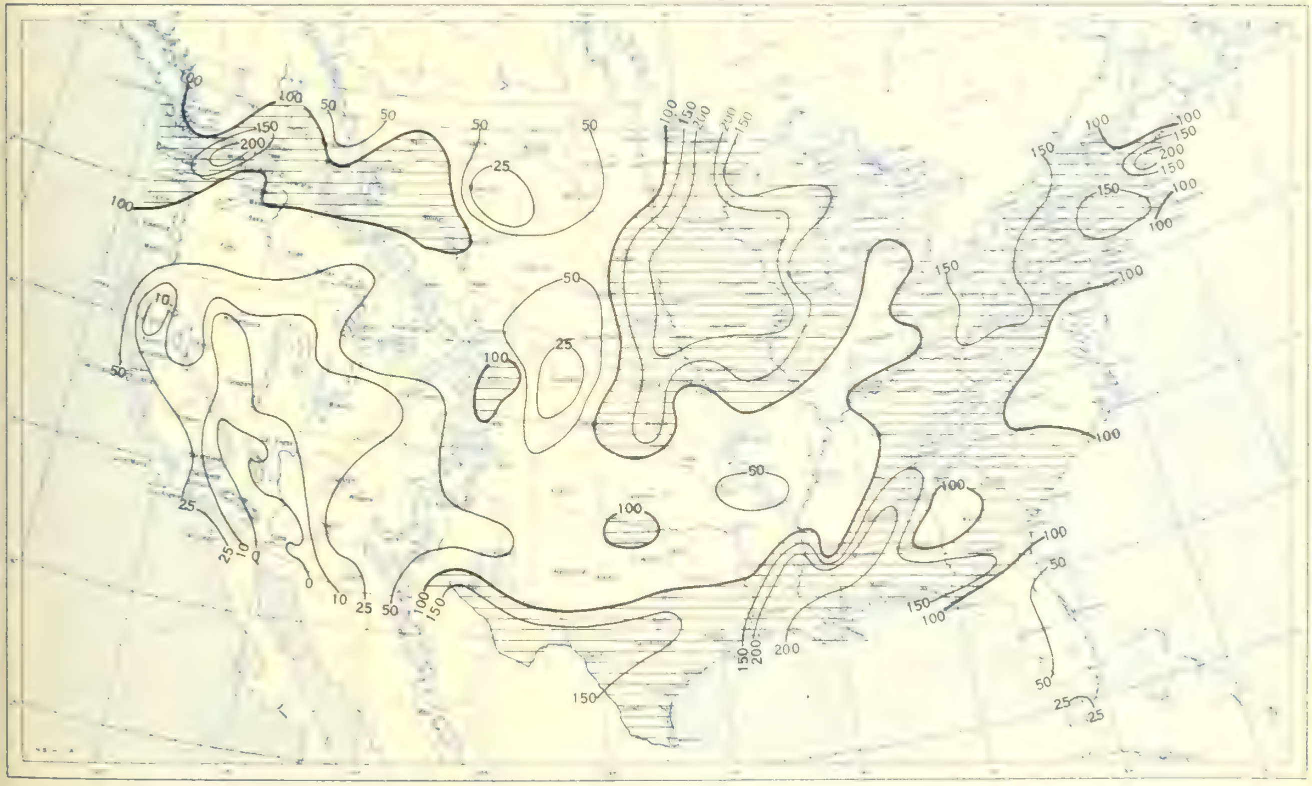


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), March 1951.

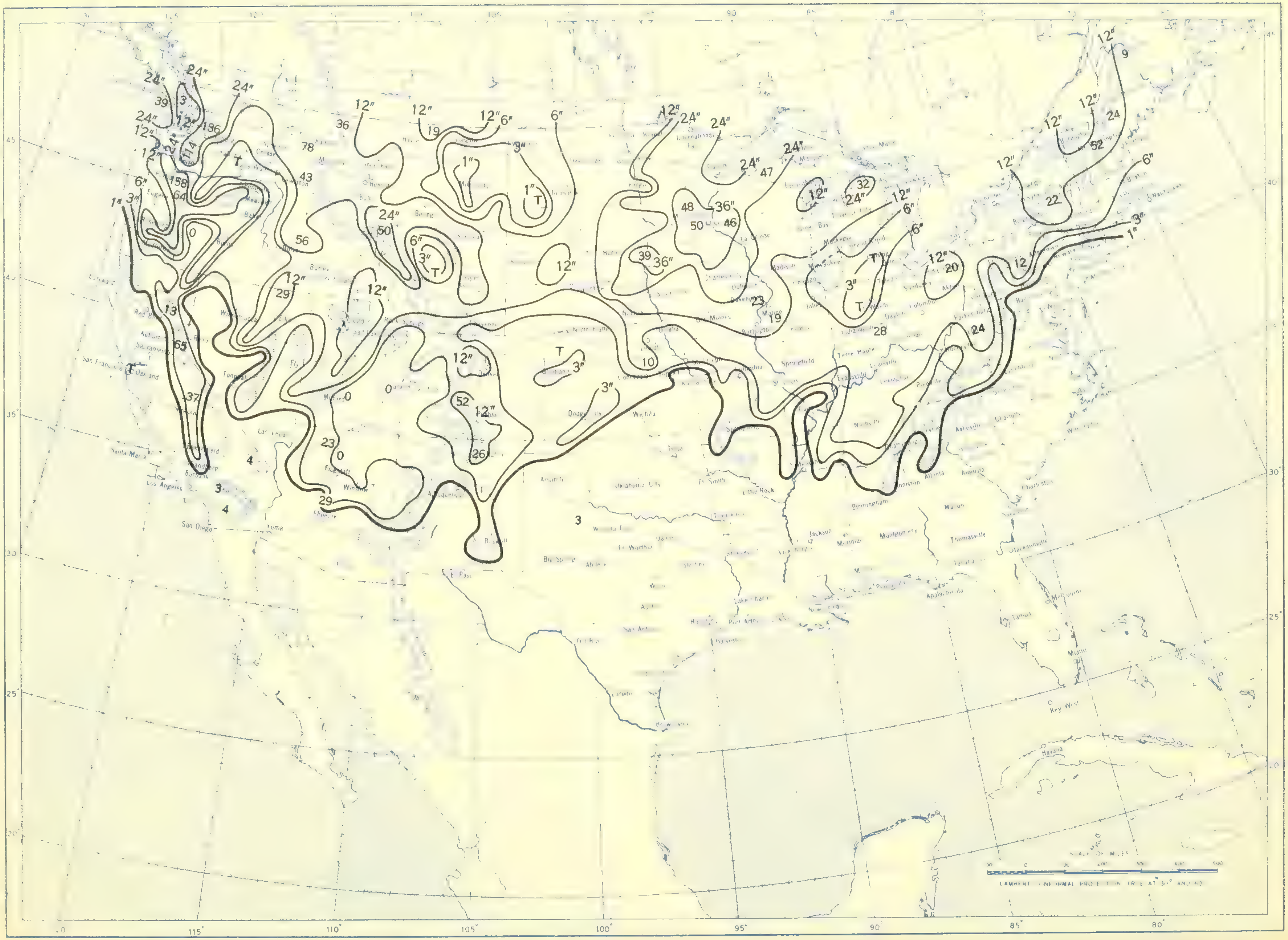


B. Percentage of Normal Precipitation, March 1951.



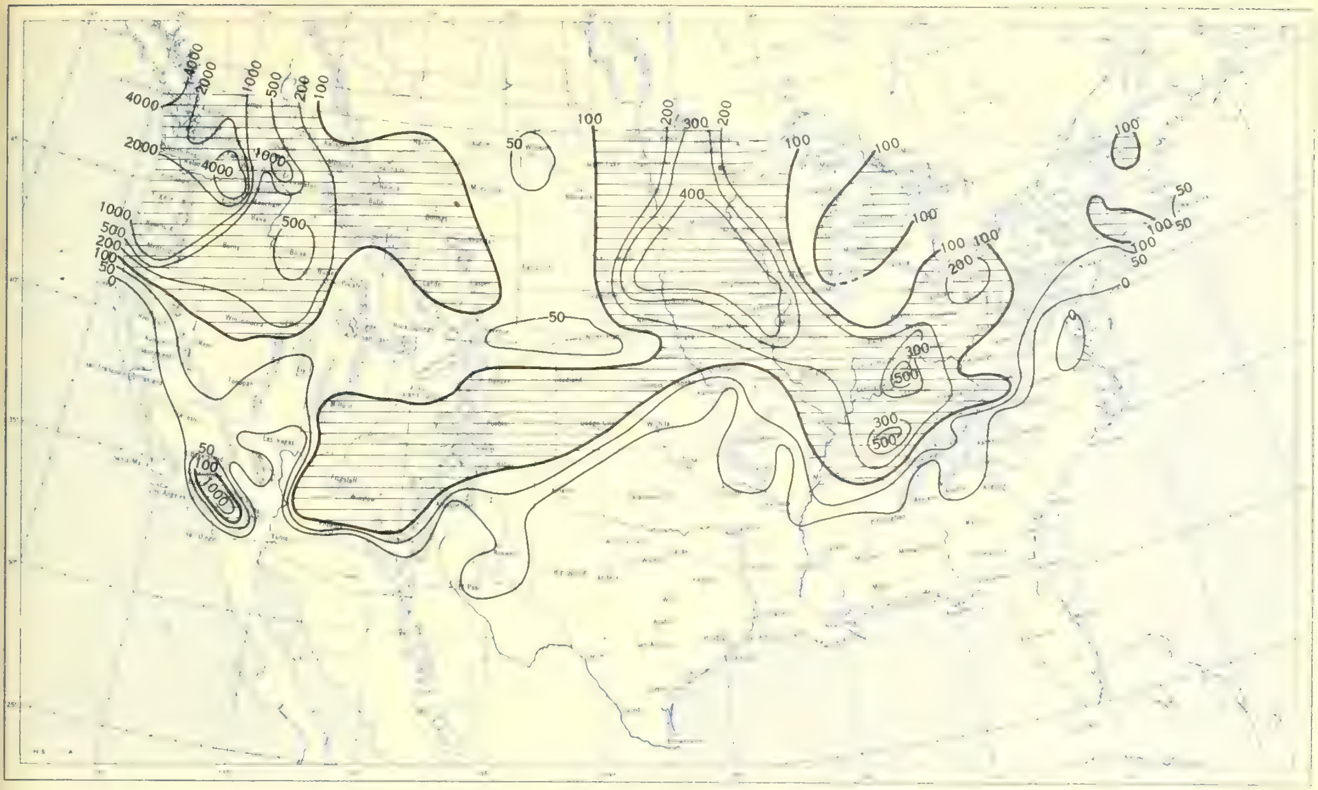
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), March 1951.

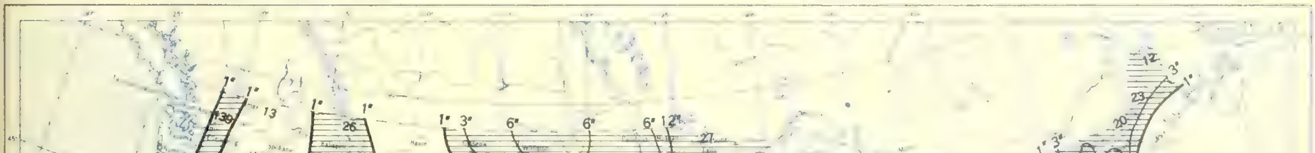


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only

Chart V. A. Percentage of Normal Snowfall, March 1951.

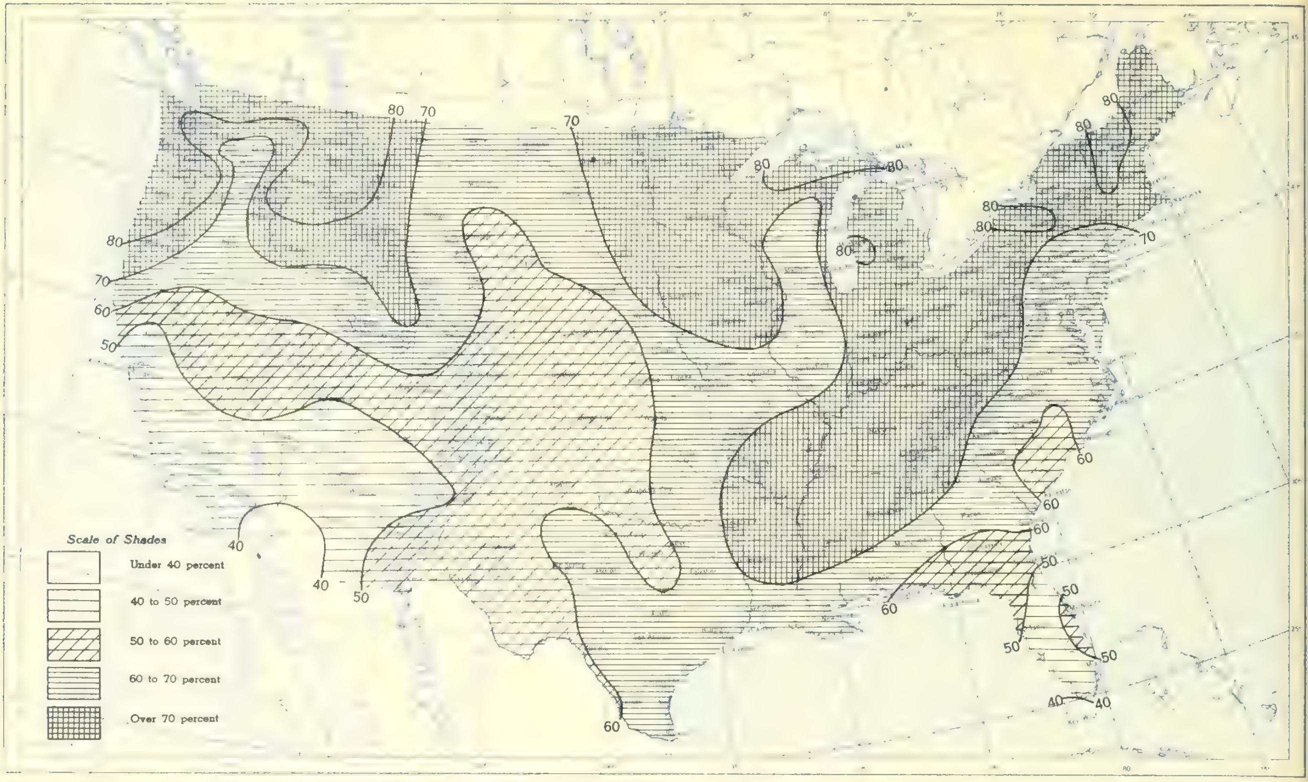


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., March 27, 1951.

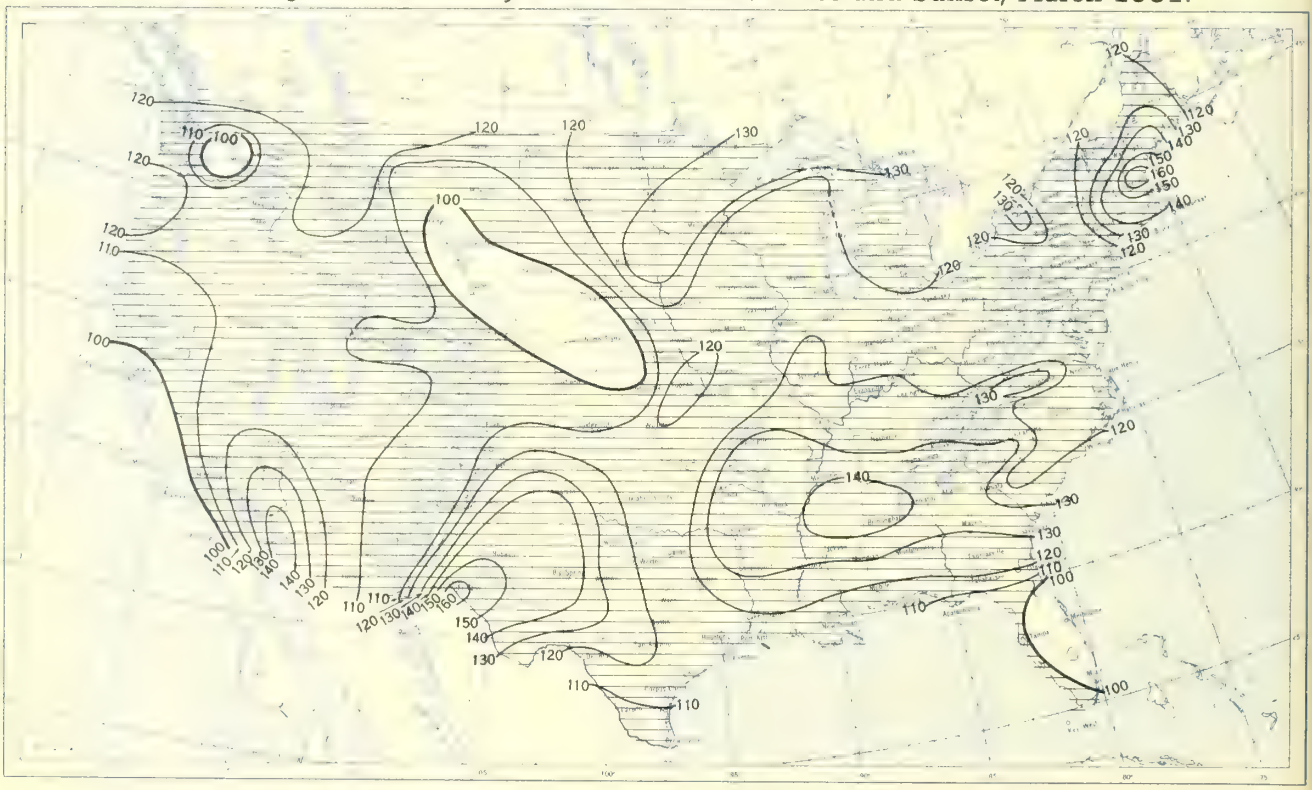


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record. B. Shows depth currently on ground at 7:30 a.m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, March 1951.

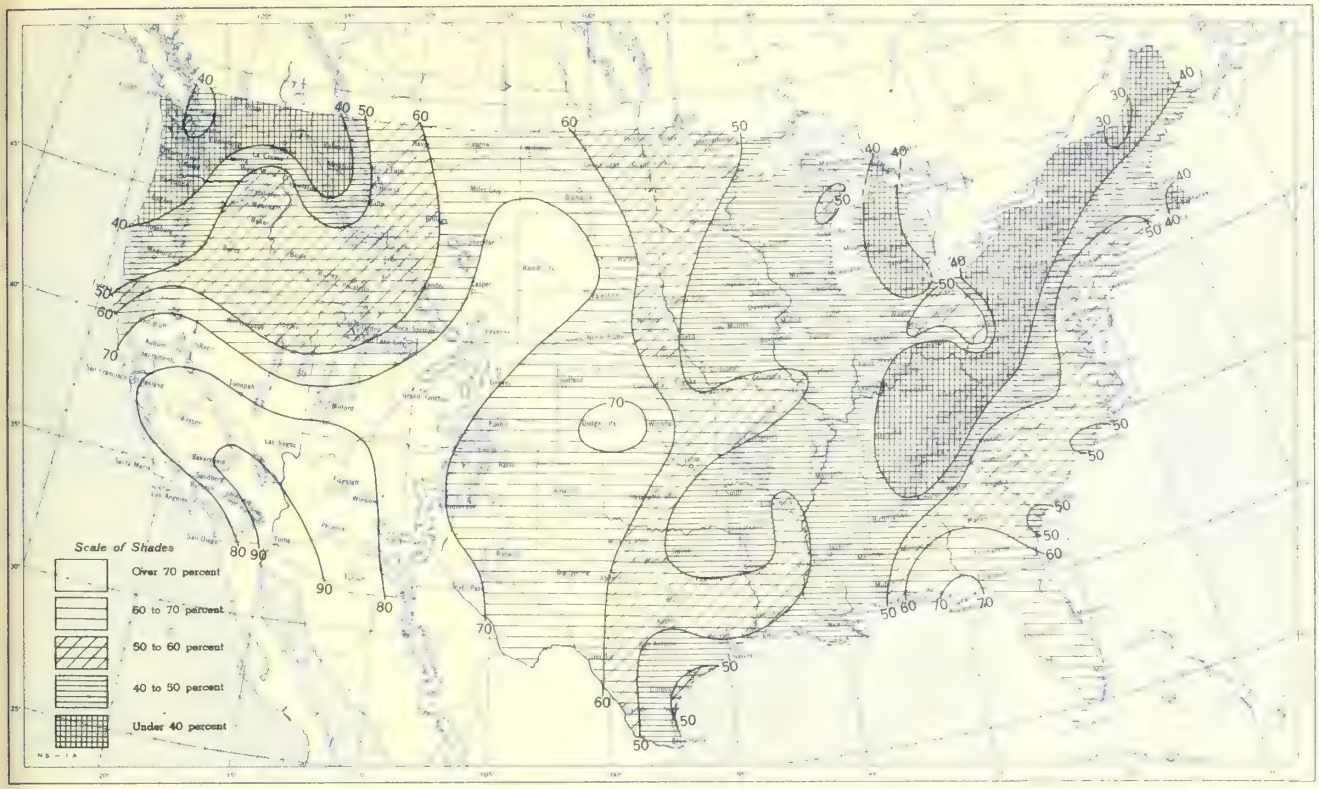


B. Percentage of Normal Sky Cover between Sunrise and Sunset, March 1951.

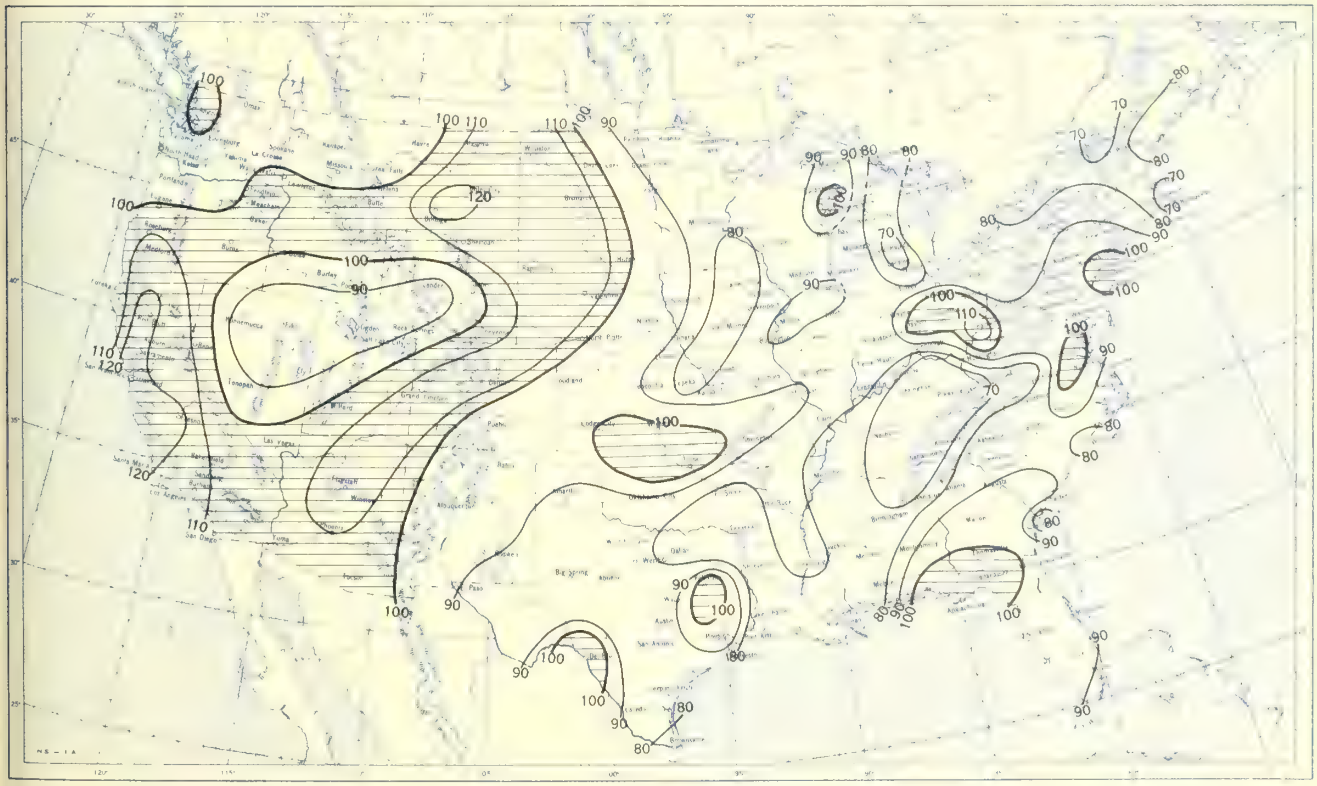


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, March 1951.



B. Percentage of Normal Sunshine, March 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, March 1951. Inset: Percentage of Normal Average Daily Solar Radiation, March 1951.

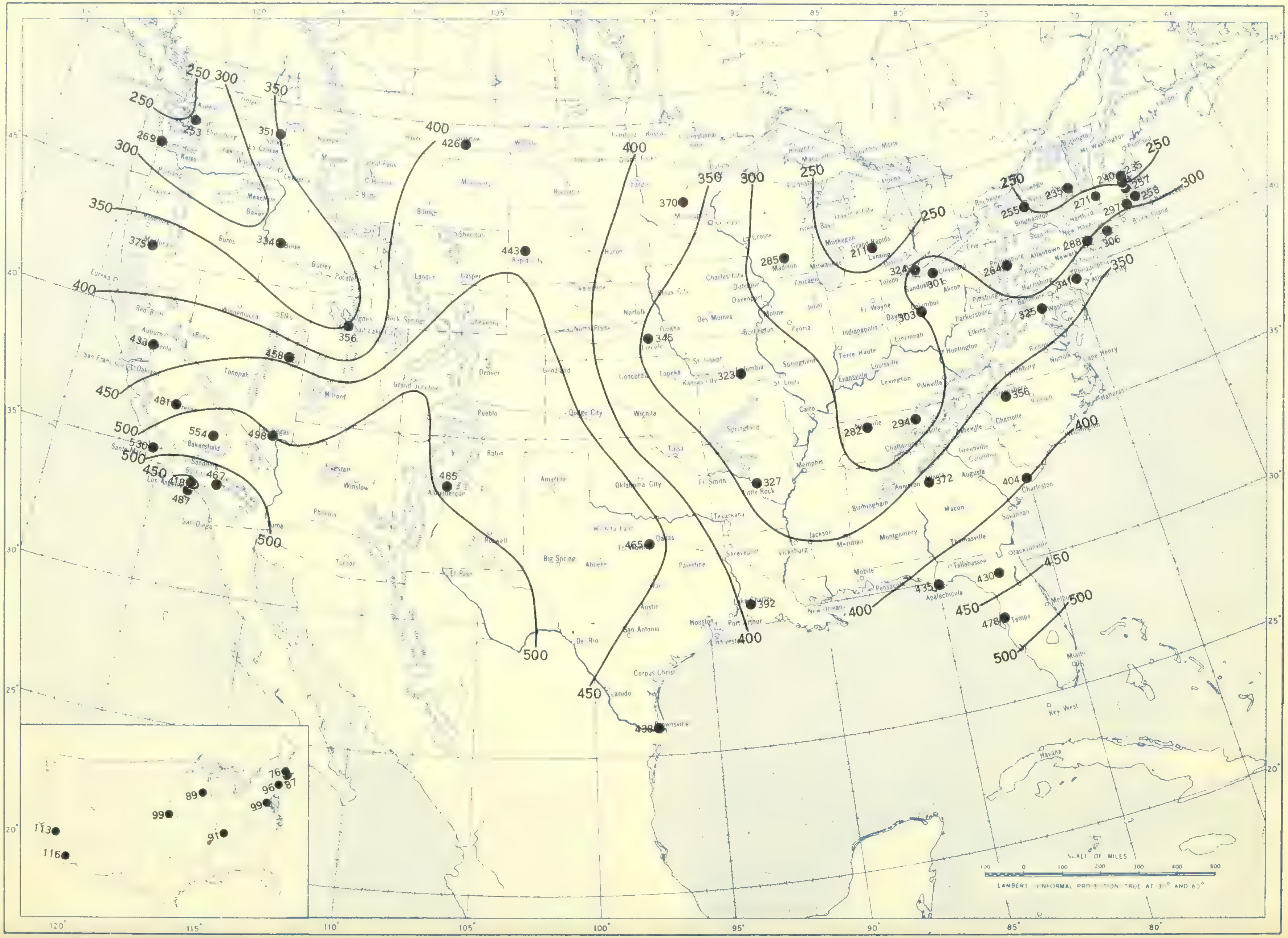
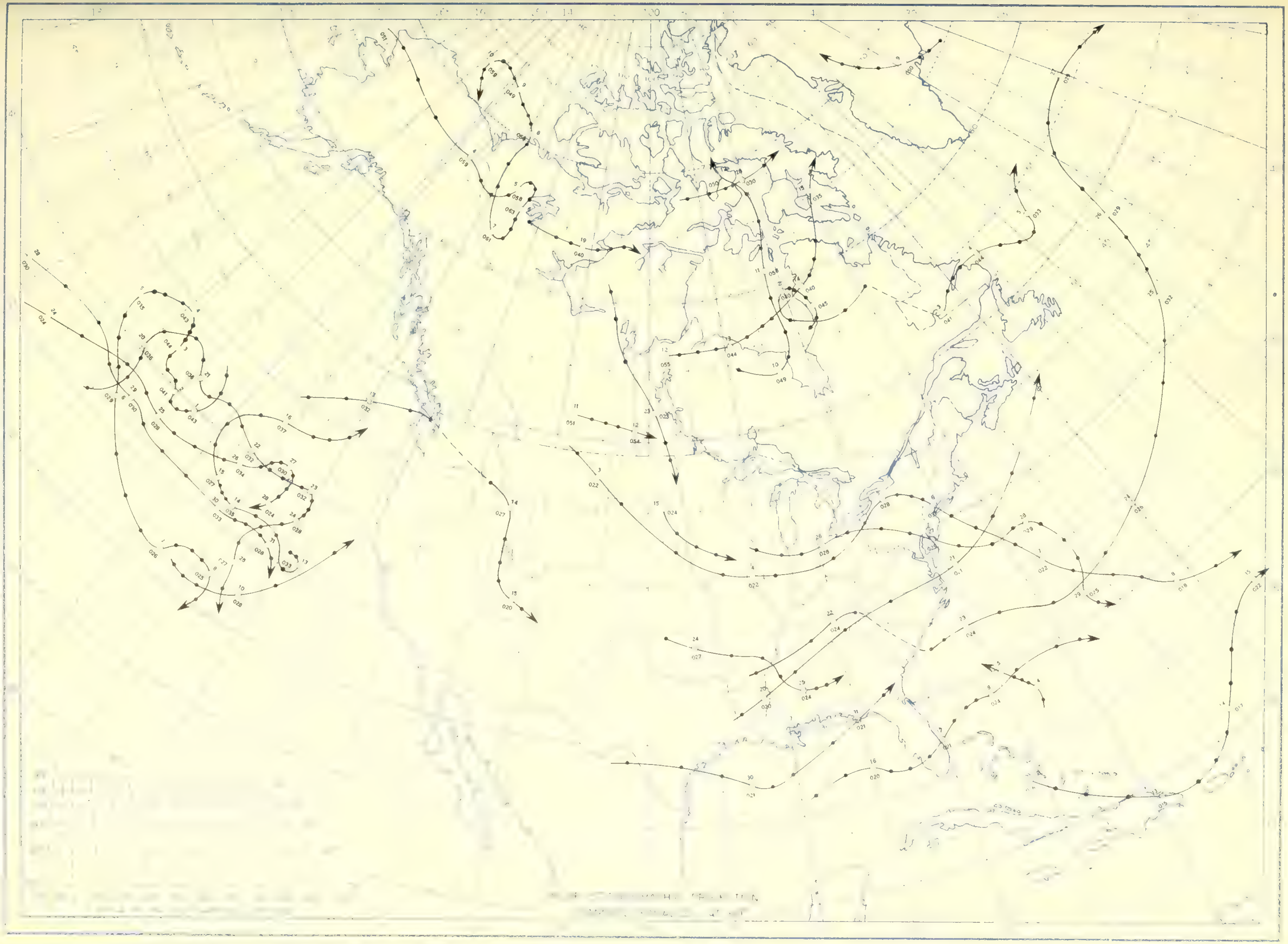


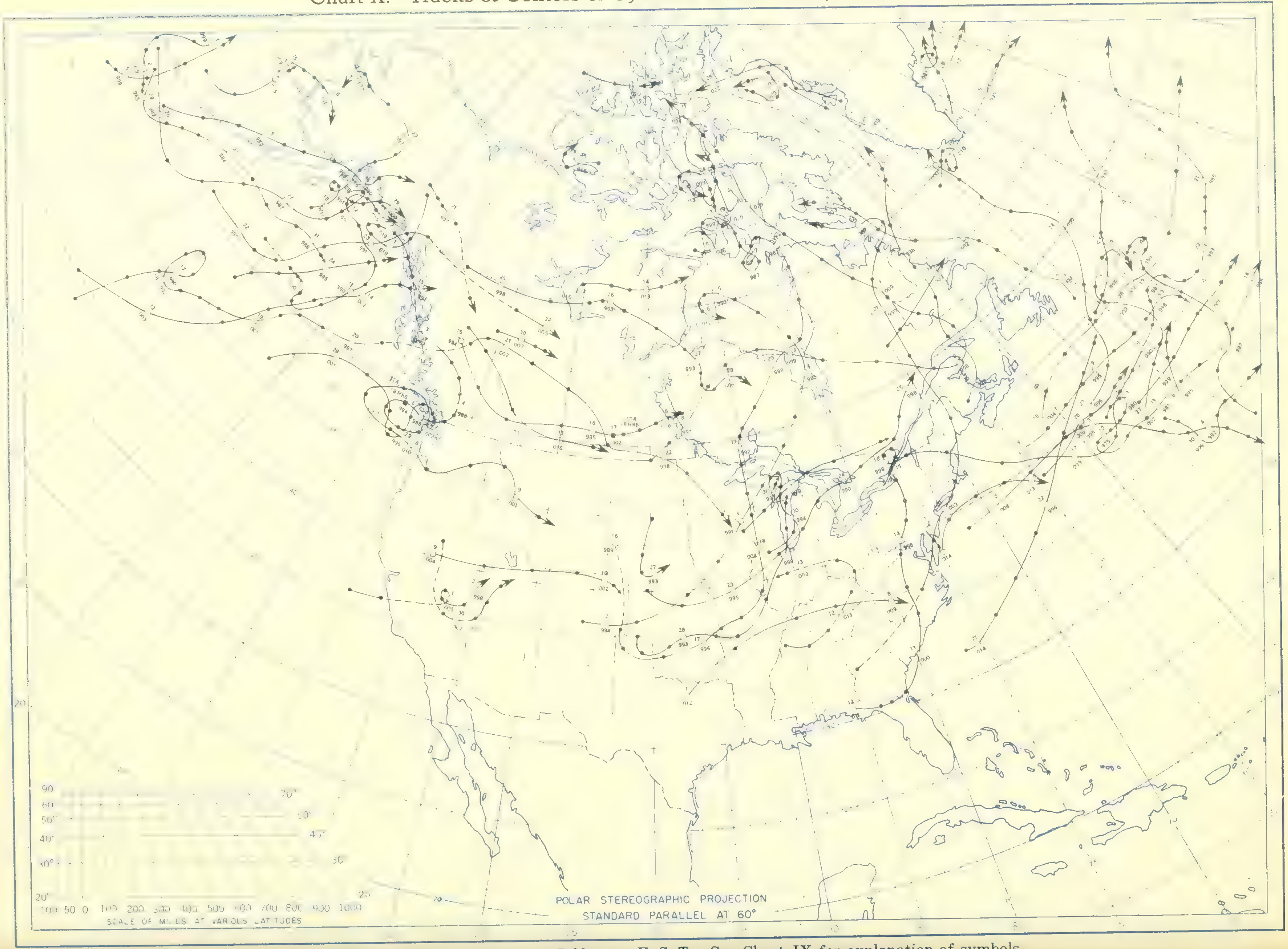
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, March 1951



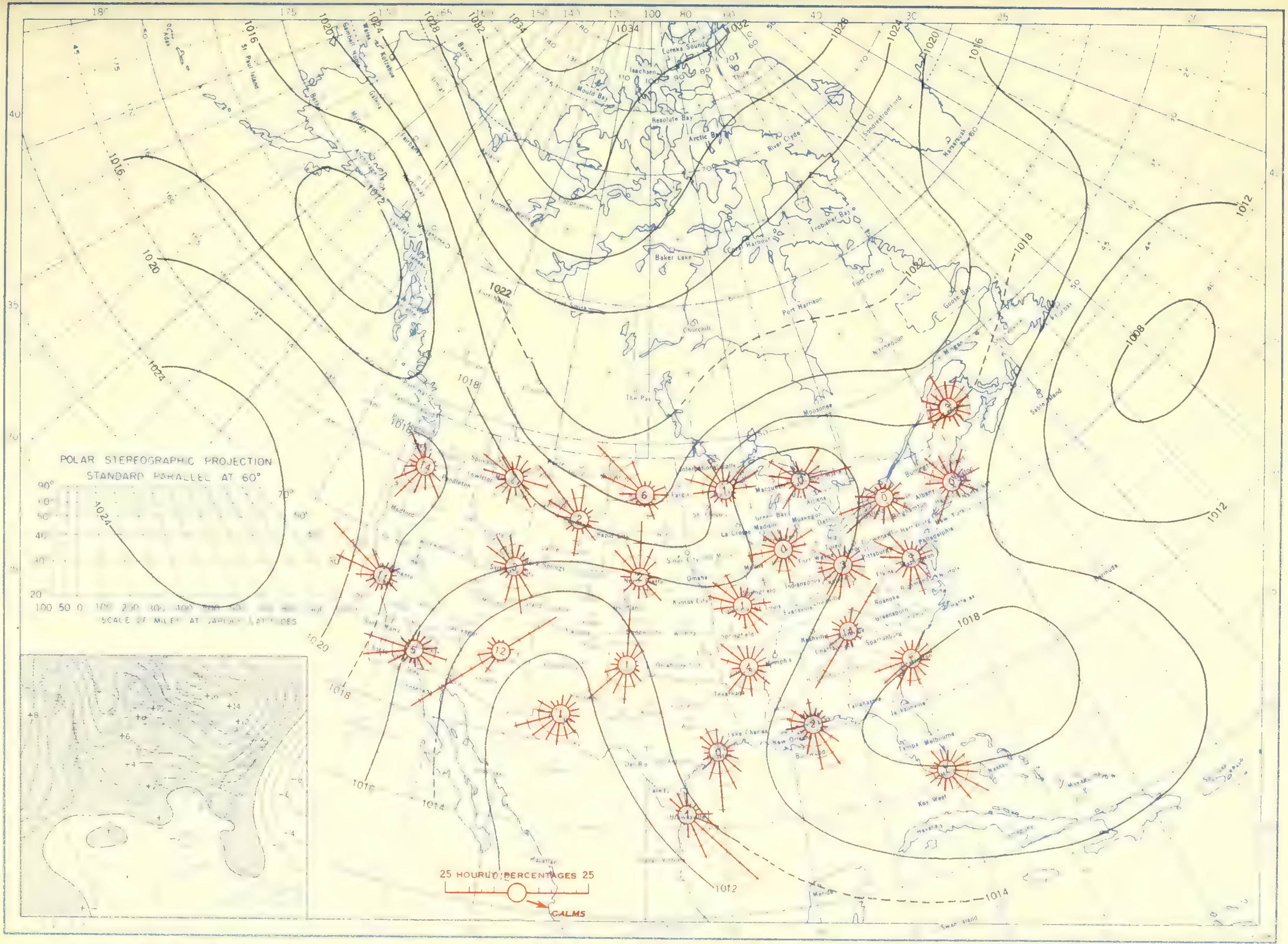
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, March, 1951.



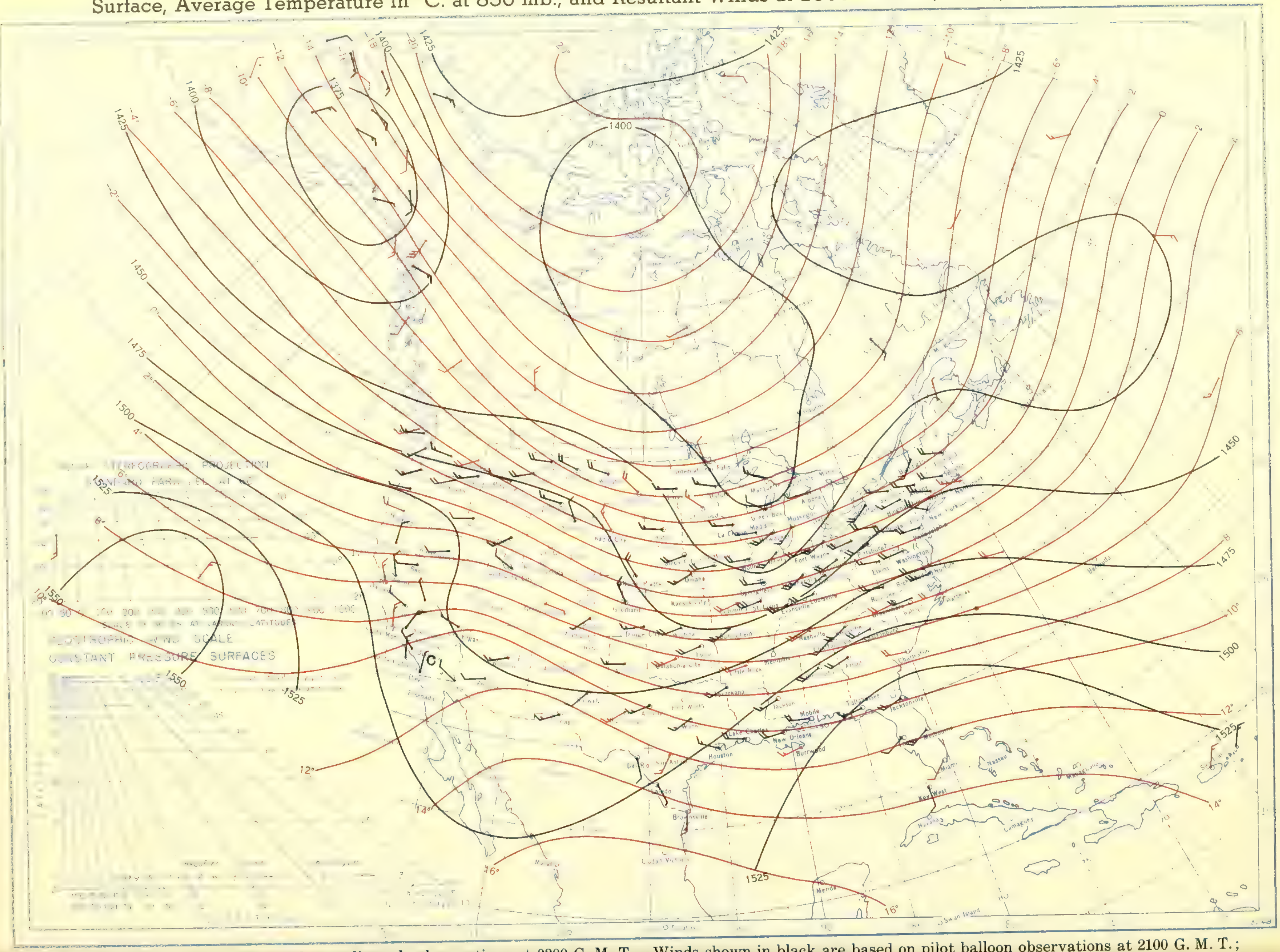
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Surface Windroses, March 1951. Inset: Departure of Average Pressure (mb.) from Normal, March 1951.



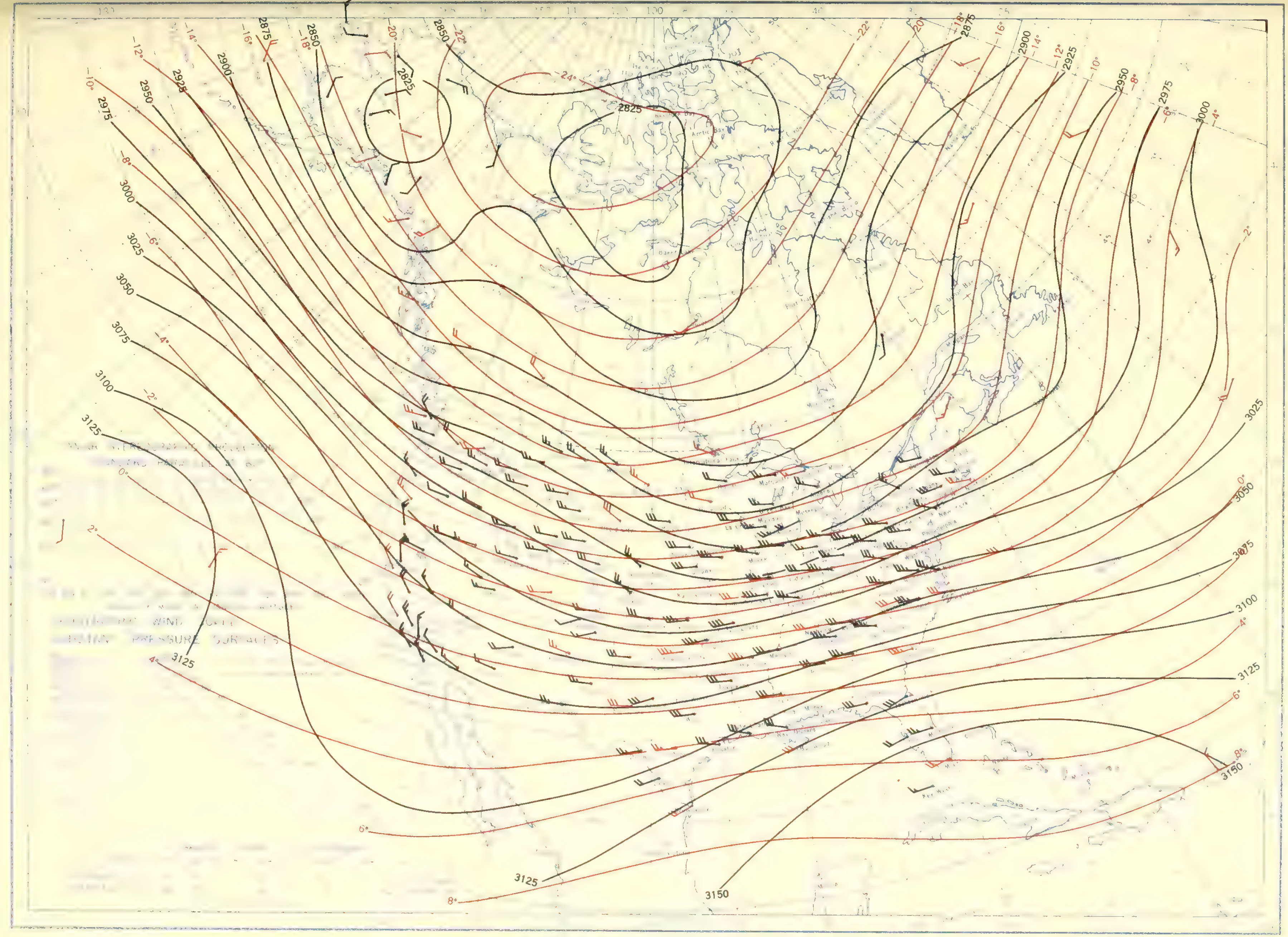
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899 1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), March 1951.



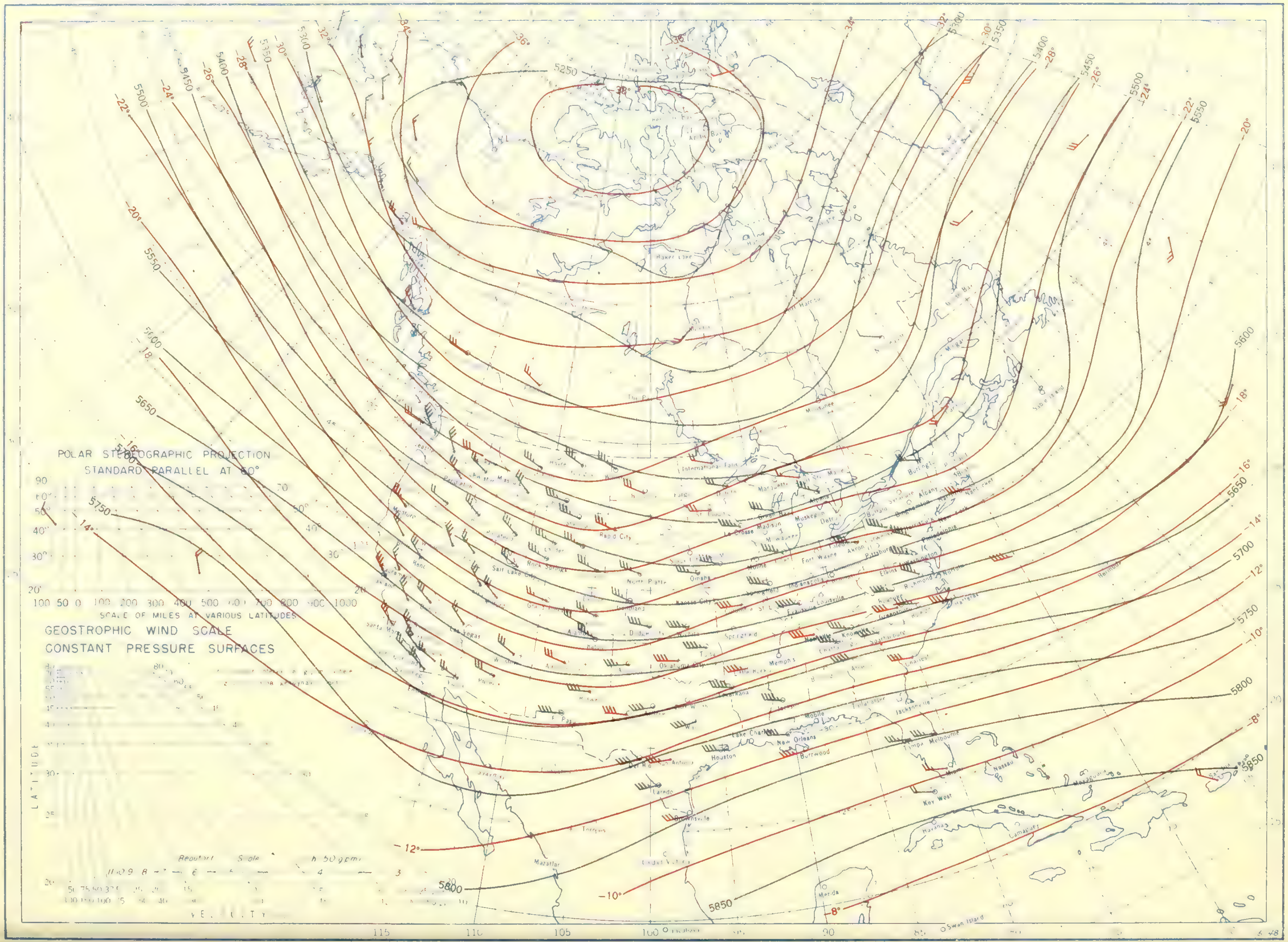
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), March 1951.



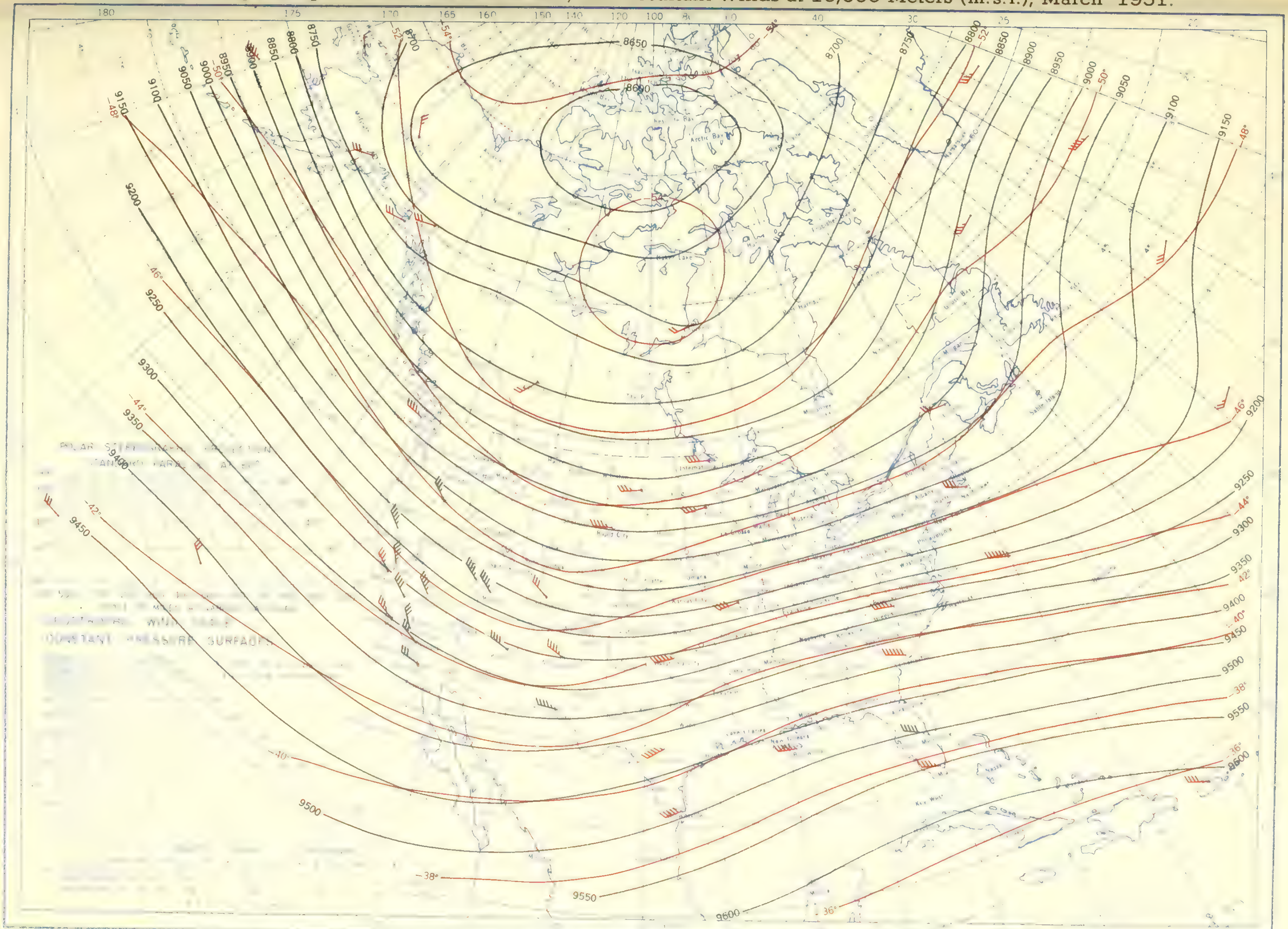
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), March 1951.



those shown in red are based on rawins at 0300 G. M. T.; … based on pilot balloon observations at 2100 G. M. T.;

Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure
°C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), March 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

AGRICULTURAL REFERENCE DEPARTMENT

U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

APRIL 1951
Volume 2 No. 4

NEW ORLEANS: 1951

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions------------------- 85

Condensed Climatological Data - States------------------- 86

Climatological Data - Stations------------------- 87

Heating Degree Days------------------- 92

Severe Storms------------------- 93

General Summary of River and Flood Conditions------------------- 98

Flood Stage Data------------------- 103

UPPER AIR DATA

Radiosonde Data------------------- 105

Pilot Balloon Data------------------- 108

Rawin Data------------------- 109

SOLAR RADIATION DATA

Solar Radiation Intensities------------------- 110

Blue Hill Data------------------- 111

Daily Totals and Average Daily Totals by Weeks------------------- 112

CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 4

APRIL 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

The first two decades of April were unusually cold and wet in central and southeastern portions of the country, warm and wet in the Northeast, and warm and dry in the far West. During the last decade the weather was cool and showery in the far West, but unusually warm throughout the East with heavy rains in many central areas. There were few unusual extremes of either temperature or precipitation. Agricultural activities were delayed and growth of vegetation slowed in central areas, and small grains continued to suffer from lack of moisture in many sections of the Southwest and lower Great Plains. Damage from the relatively few severe storms was small. Damaging floods occurred along the upper reaches of the Mississippi River and the Red River of the North Valley.

The April 1951 average temperature for the United States was 51.2°F, which is 1.3° below the long-term mean, and 1.1° above the average for 1950. Average temperatures generally were below normal west of the Continental Divide and in the Northeast, with extreme departures ranging up to 5° or more in the Northeast and at a few stations in north-central California and south-central Oregon. Elsewhere, temperatures averaged below normal for the month, with departures ranging up to 5° or more in the central Great Plains. Temperatures averaged highest in Florida, 68.7° and lowest in North Dakota, 38.5°. Temperatures were nearly normal in Virginia with a minus departure of only 0.1°, while Iowa showed the greatest positive departure, 4.5°, and Maine the greatest negative departure, 2.9°. Laredo, Tex. recorded the month's highest temperature, 106° on the 30th, and Summit, Mont., recorded the lowest, -18° on the 21st.

Successive cold air invasions brought below freezing temperatures as far south as the northern portions of most of the extreme Southern States during the periods of April 2 to 4, 11 to 13, and 16 to 18. Most stations east of the Great Plains recorded their lowest temperatures on the 17th, 18th, or 19th, although minima occurred at a number of stations in the extreme Northeast on the 5th and 6th and in a few extreme southern sections on the 3d and 4th. The coldest weather in the Northwest occurred from about the 18th to 22d when some stations, including Seattle, Wash., and Portland, Oreg., recorded their lowest April temperatures on record.

Practically all stations east of the Continental Divide recorded their highest temperatures during the last week when a low pressure system, moving from the central Rocky Mountain Region to eastern Canada, brought southerly winds to the Northern Border. Monthly maxima in the 80's were recorded from North Dakota to New England.

The nation's average precipitation for April 1951 was 2.27 inches, 0.20 of an inch below the long-term mean. The greatest monthly total was 11.99 inches at Fort Drum, Fla., while 11 stations in Texas and 1 or more in California, New Mexico, and Oregon did not report any. Monthly totals were much above normal in the Lake Region, Iowa, eastern Nebraska, Kansas, western Montana, Utah, parts of Nevada, southern Arizona, and the central portion of the Florida Peninsula, and moderately above in northern Arizona, southern California, the Appalachian Region, and much of the Northeast. In the far West most of the precipitation occurred near the end of the month, while in the central and eastern sections of the country it was well spaced throughout the month, especially in the northern two-thirds where it was usually associated with frequent cold fronts and low pressure waves. Monthly totals were less than 50 percent of normal in Texas, western Louisiana, and in the Pacific Northwest. Tatoosh Island, Wash. received only 16 percent of normal and Port Arthur, Texas only 15 percent. Monthly totals were slightly less than 50 percent of normal at many stations in the Dakotas, northwestern Minnesota, and northeastern Wyoming.

Heavy rains with 24-hour totals exceeding an inch fell along the Atlantic Coast from the Carolinas to Maine on the 2d and 3d, in the central Great Plains the 5th and 6th, in most of the Mississippi Valley the 6th and 7th, sections of the Southeast the 7th and 8th, Arkansas the 11th, Michigan and the middle Atlantic States the 13th, central Gulf areas the 16th and 17th, east-central Florida the 19th, the central Great Plains the 21st, the central Gulf States the 22d, central Iowa the 25th, New England and northern lower Michigan the 26th, eastern Nebraska the 27th, the north Pacific Coast the 28th, and in Wisconsin and Iowa on the 29th.

Monthly snowfall totals were above normal at a few stations in the Northeast, in a small belt extending from Lexington, Ky., into central Tennessee, northwestern Indiana and northern Illinois, central and northwestern Missouri, western Iowa, a belt around Lake Superior, the northern Rocky Mountains, and a few stations in the Sierra Nevada Mountains of central California.

Frequent snowfall in north-central areas during the first 3 weeks was generally light although occasionally moderate to heavy. Eastern South Dakota received up to 5 inches on the 1st and up to 6 or 8 inches in some sections during the first part of the second decade. The most extensive snowfall in north-central areas occurred during the period April 10 to 15, ranging from flurries in Oklahoma to moderate to heavy amounts in the extreme north. From the 13th to the 15th Marquette, Mich. received 14.9 inches. Moderate to heavy amounts drifted by strong winds delayed traffic in Minnesota on the 10th. The Ohio Valley received most of its snow during the first week although traces were reported from some stations on the 16th and 17th.

In the far West the mountain snowpack at the end

GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

of the month was generally subnormal in the south but sufficient in most northern areas to assure a plentiful water supply for irrigation. Snowfall in the Cascades was topped by 97 inches at Paradise Ranger Station, although monthly totals of snowfall in these mountains were below normal. A heavy snowstorm and near blizzard conditions broke telephone poles and blocked roads along the Continental Divide in Montana during the last 2 days of the month.

In the Northeast snowfall was below normal, with measurable amounts generally confined to the mountains. No snow fell in Delaware. In Pennsylvania the average total for the State was the least since 1948, and only 12 stations recorded up to 4 inches or more. New York received only 25 percent of normal. During one of the heaviest storms in the Northeast, 5 to 8 inches of snow fell in the Berkshire Region of New Hampshire.

At the end of the month snow on the ground was almost entirely confined to mountain regions of the far West and Northeast and a few patches along the North-Central Border.

Cool, wet weather during the first 3 weeks further delayed farm activities and slowed growth of vegetation in most central sections; and, despite warm, sunny weather during the last week, agriculture was still 1 to 3 weeks behind normal at the end of the month. Weather conditions were more favorable in the Pacific and Atlantic Coastal States, and farm work and crop growth advanced satisfactorily.

In spite of a colder than normal April in many areas there was relatively little damage to crops by frost or freezing temperatures. There was practically no damage east of the Rocky Mountains, since vegetation had not advanced to a susceptible state. Local damage occurred in the Northwest during a cold period from the 18th to the 21st. Fruit suffered light to locally heavy damage from a heavy freeze in Montana west of the Divide, and from heavy frost in eastern Washington, northern and eastern Oregon, and south-central Idaho. Many young evergreens were also damaged in western Montana.

At the end of the month prospects for winter grains continued poor in southwestern sections; namely, New Mexico, the High Plains of western Texas, southwestern and west-central Oklahoma, and southwestern Kansas. Due to drought, winterkill, and insects, abandonment was much heavier than usual in these areas.

Heavy rains caused extensive flooding in Iowa during the first week, forcing the evacuation of homes in a number of cities such as Ottumwa, Spencer, Charles City, and Waterloo. Much more serious, however, was flooding along the Mississippi River later in the month that reached record stages at several points, forcing hundreds of families from their homes. In Minnesota flooding along the Mississippi and the most disastrous flood in history along the Minnesota River caused damage estimated close to $6,000,000. The Mississippi flood also caused considerable damage in Wisconsin and northeastern Missouri. During the first week of April severe flooding along the Big Sioux River caused damage in Sioux Falls, estimated to be between $1,000,000 and $2,000,000. There was considerable flooding along the Red River of the North Valley, especially in the Fargo, N. Dak., area, but estimates of damage are not yet available.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

APRIL 195

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F	°F		°F			°F		In	In		In		In.
Alabama	61.8	1.6	3 Stations	91	*27	Valley Head	27	17	5.16	+0.52	Fairhope	8.37	Falls City	2.41
Arizona	57.3	.6	Yuma WB Airport	100	13	Alpine	8	1	1.42	+.77	Junipine	5.96	Klagetoh	.11
Arkansas	58.1	-3.5	2 Stations	90	*27	Harrison	21	17	4.43	.61	Prescott	8.32	Cummins Farm	1.80
California	57.1	+.6	4 Stations	103	*9	Twin Lakes	3	30	1.48	.07	Cuyamaca	5.79	Amboy	.00
Colorado	42.2	1.7	2 Stations	92	28	Westcliff	[illegible]	11	1.49	.25	Independence Pass	7.02	Fountain 9NE	.05
Connecticut	49.1	+2.8	Greenwich	83	29	2 Stations	25	*6	3.36	.31	Baltic	6.37	Hartford WB AP	2.34
Delaware	52.8	+.2	Millsboro	92	26	Georgetown	27	18	2.63	.85	Del. City Reedy Pt.	3.37	Millsboro	2.01
Florida	68.7	1.2	Hialeah	93	30	Secotan	34	4	1.21	+1.18	Fort Drum	11.99	Marineland	.30
Georgia	62.1	1.6	Valdosta WB AP	92	30	Blairsville Exp. Sta.	25	5	3.67	-.14	Suches	9.52	Brunswick	1.03
Idaho	46.3	+1.1	2 Stations	85	13	Mullan Pass CAA	2	19	1.06	-.31	Hailey	2.74	Swan Falls	.14
Illinois	49.6	-2.9	Jerseyville	92	28	Walnut	22	5	3.45	-.10	Mattoon	5.93	Barry	1.00
Indiana	49.0	2.2	Evansville	92	28	2 Stations	23	*17	3.44	-.16	Leavenworth Dam	5.65	Princeton	1.92
Iowa	44.1	4.5	Red Oak	87	28	do	18	17	4.96	+2.35	Tripoli	11.23	Keokuk L & D 19	1.85
Kansas	51.0	3.5	3 Stations	94	*28	Atwood	13	16	2.53	.02	Wichita WB AP	6.33	Richfield 4N	.35
Kentucky	53.8	2.4	Russellville	92	28	Mammoth Cave Park	23	17	3.30	.67	Baxter Harlan Wtr.Wks.	5.15	Willow Lock 13	1.92
Louisiana	61.2	-2.7	Covington	91	26	Plain Dealing	30	3	3.14	-1.58	Pearl River	10.19	Hackberry	.47
Maine	43.8	+2.9	2 Stations	72	29	Lac Frontier	10	5	5.90	+2.77	Rumford 3 SW	7.64	Clayton Lake	3.79
Maryland	5[illegible].0	+.7	6 Stations	88	29	New Germany	19	18	3.55	+.11	Shallmar	5.30	Cumberland Pol. Brks.	1.66
Massachusetts	48.[illegible]	+2.7	2 Stations	77	*29	Birch Hill Dam	21	21	3.04	.51	Adams	4.89	New Bedford	1.61
Michigan	42.[illegible]	.2	Vanderbilt	86	28	Watersmeet U.S. For.	5	19	3.52	+1.11	Iron Mt. Water Works	7.07	Paradise	1.38
Minnesota	39.2	3.1	Winona	85	29	Itasca State Park	7	17	1.96	.09	Harmony	6.63	2 Stations	.56
Mississippi	62.2	2.1	Aberdeen	92	28	2 Stations	30	17	4.71	-.16	Picayune	10.11	Purvis	1.63
Missouri	51.6	3.8	Elsberry	93	29	Black 6NW	19	17	3.05	.99	Mansfield	7.65	2 Stations	1.58
Montana	39.7	5.6	2 Stations	88	29	Summit	18	21	1.07	-.05	Mike Horse	3.87	Lonesome Lake	.02
Nebraska	45.1	1.2	Madison	92	30	Harrison	0	15	2.94	+.57	Sterling	7.94	Harrison 10NE	.40
Nevada	50.1	+1.2	No Las Vegas Doxarm	95	9	Fish Creek Ranch	9	*1	1.12	+.33	Jarbidge	3.12	Las Vegas WB AP	.04
New Hampshire	41.6	+2.6	Windham	74	*29	Lebanon CAA AP	19	6	1.41	+1.33	Pinkham Notch	7.29	Durham	1.93
New Jersey	51.3	+1.5	Paterson	89	30	Layton 3NW	22	6	3.01	-.51	Greenwood Lake	6.74	Berlin	1.40
New Mexico	51.5	.8	Jal	96	24	Philmont Ranch	1	11	.66	-.20	San Cristobal	3.52	4 Stations	.00
New York	45.4	+1.1	3 Stations	84	29	Peru	18	1	3.47	+.15	Piseco	7.76	Truxton 5N	1.55
North Carolina	57.9	.2	2 Stations	93	30	Mt. Mitchell	13	17	3.95	+.10	Coweeta No. 8	8.23	Kinston	1.93
North Dakota	38.5	2.8	8 Stations	84	*28	Bowbells 5E	5	1	.81	-.61	Bowman 11SE	3.05	Lefor 10E	.16
Ohio	48.7	1.1	2 Stations	90	*28	3 Stations	21	18	3.21	-.03	Carrollton 2SW	5.08	Fernbank	1.87
Oklahoma	58.2	2.3	Alva	97	29	4 Stations	23	*3	2.06	1.47	Kiamichi Tower	5.12	Kenton 6N	.08
Oregon	49.0	+1.1	Brookings	92	10	Chemult	5	2	.97	-1.09	Valsetz	4.07	Unity	.00
Pennsylvania	48.1	.2	Putneyville 2SE	89	29	4 Stations	18	*18	3.76	+.31	Irvin	7.29	Middletown Olmstead	1.19
Rhode Island	49.7	+4.1	Providence WB City	71	*26	Kingston	28	*5	3.15	-.62	Austin	4.23	Block Island WB City	2.27
South Carolina	61.1	1.3	Saluda	91	30	Caesars Head	28	17	3.22	-.03	Long Creek	6.22	Beaufort	.90
South Dakota	41.7	-1.3	Ardmore 1NNE	91	29	3 Stations	0	*16	1.18	-.89	Vermillion	4.77	Pollock	.08
Tennessee	55.7	3.0	2 Stations	91	*28	Gatlinburg	25	*17	4.85	+.51	Jackson CAA AP	7.28	McKenzie	2.74
Texas	61.3	.6	Laredo WB AP	106	30	3 Stations	20	11	.99	1.62	Archer City	6.56	11 Stations	.00
Utah	48.6	+1.6	Zion National Park	88	11	Silver Lake Brighton	6	*1	1.63	+.11	Alta	4.98	Greenriver	.14
Vermont	43.5	+2.6	Vernon	72	30	Lemington	19	22	1.15	+1.22	Searsburg Mountain	5.48	Chelsea	2.78
Virginia	51.5	.1	Walkerton	91	29	2 Stations	19	18	3.82	+.56	Meadows of Dan	7.63	Langley A.F. Base	1.36
Washington	48.8	+.2	Malott	98	16	Mt. Spokane	5	19	.71	1.15	Naselle	3.21	3 Stations	T
West Virginia	51.0	.9	2 Stations	89	*28	Cranberry Glades	9	18	4.13	+.61	Cranberry Glades	9.23	Williamson	2.25
Wisconsin	41.8	1.[illegible]	Kenosha	87	28	Long Lake Dam	10	19	3.97	+1.50	Steuben	6.57	Willow Reservoir	1.59
Wyoming	38.6	1.7	2 Stations	80	*13	Foxpark	2	16	1.22	-.43	Bill 11SE	3.04	Hairden	.03
Alaska (Feb.)	.1	3.8	Ketchikan	49	21	Umiat WB	63	20	1.51	+.18	Ketchikan	12.28	Wainwright	T
Hawaii (March)	69.8	+.3	Puunene Airport	91	1	Haleakala Ranger Sta.	37	*8	16.91	+8.36	Kahana	54.64	Kulani Mauka	1.80
Puerto Rico	75.7	+.8	Dorado (2)	96	9	Garzas Dam (2)	52	21	5.08	+1.10	Lares	15.94	Lajas (Hacienda Ma. Luisa)	.24

CLIMATOLOGICAL DATA

Table 2

APRIL 1951

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)					
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
ALABAMA																																	
Birmingham	610	990.2	1015.4	73	48	60.4	-1.3	86	30	33	4	0	0	47	66	6.19	+1.38	1.97	10	8	.0	0	9.5	SW	41	NE	27	7	11	12	5.8	56	186
Mobile CO	10	------	------	74	56	65.3	-1.0	84	*26	42	4	0	0	--	--	6.63	+2.00	3.23	11	3	.0	0	12.0	--	36	E	22	10	11	9	5.4	64	81
Mobile	211	1007.5	1015.3	75	54	64.8	-----	85	28	39	4	0	0	54	74	6.61	-----	3.00	11	5	.0	0	11.3	SE				11	16	9	5.0	--	95
Montgomery CO	201	------	------	75	53	64.1	-1.2	88	27	39	3	0	0	--	--	3.44	-.86	1.30	8	-	.0	0	-	---		---					---	--	111
Montgomery	198	1007.8	1015.2	76	51	63.5	-1.8	88	27	36	4	0	0	50	68	4.02	-.28	1.25	12	8	.0	0	8.6	SW	31	W	2	13	10	7	4.2	78	121
ARIZONA																																	
Flagstaff	6993	784.3	1014.0	57	28	42.2	-----	70	13	18	13	0	26	24	57	1.74	-----	.74	8	2	12.5	9	8.9	SW	-	—	—	9	7	14	6.2	—	682
Payson CO	5000	845.6	1012.4	67	38	52.3	-----	80	13	24	1	0	5	32	53	2.61	-----	.62	8	3	T	T	5.7	S	--	---	--	8	9	13	6.0	—	372
Phoenix CO	1083	------	------	82	55	68.2	+1.2	94	23	43	1	4	0			1.58	+1.18	.83	6	3	T	T	7.0		35	W	26	-		-	---	83	35
Phoenix	1108	971.6	1010.2	82	53	67.8	-----	96	23	41	2	3	0	40	42	1.02	+.62	.27	6	2	.0	0	5.6	E	--	--	-	8	11	11	5.3	--	36
Prescott	5014	844.2	1011.9	67	37	51.8	--	80	10	25	1	0	5	24	43	1.33	-----	.61	9	2	T	T	9.9	SW	35	SW	28	8	9	13	5.8	66	388
Tucson	2558	922.8	1010.7	78	51	64.4	0	92	23	33	1	1	0	32	36	1.66	+1.33	.42	8	3	T	T	7.3	SSE	31	W	29	10	10	10	5.2	81	81
Winslow	4880	848.3	1009.8	69	38	53.3	+.1	80	23	25	11	0	7	24	39	1.18	+.69	.45	6	3	T	0	10.8	SW	*42	SSW	29	13	5	12	5.0	--	342
Yuma	203	1005.4	1010.6	87	56	71.6	----	100	13	44	1	12	0	38	37	.40	----	.29	1	2	.0	0	8.8	SSE	*32	WSW	29	11	13	6	4.1	92	9
ARKANSAS																																	
Fort Smith	458	996.3	1013.0	70	46	58.4	-3.4	88	27	29	17	0	2	43	63	3.13	-.81	1.65	8	6	T	0	10.6	W	56	W	8	8	8	14	6.1	54	240
Little Rock	257	966.8	1013.5	69	49	59.2	-2.9	85	28	34	17	0	0	46	66	3.81	-1.38	.84	9	8	T	0	8.3	SW	30	NE	5	7	9	14	6.1	60	216
Texarkana	361	1000.3	1013.4	73	51	61.7	-3.0	85	30	35	3	0	0	48	66	5.56	+.14	1.02	12	9	T	0	11.5	SSE	--	---	-	10	9	11	5.5	—	155
CALIFORNIA																																	
Bakersfield	489	995.3	1013.2	77	51	64.1	+1.3	94	11	40	1	5	0	43	52	.87	+.35	.42	3	1	T	0	5.7	WNW		- -	--	10	12	8	5.3		91
Beaumont CO	2589	923.5	1013.7	68	42	55.2	-----	83	13	28	1	0	1	39	65	2.26	-----	1.11	13	1	T	T	8.1	W	27	E	11	10	3	17	6.6	-	289
Bishop	4108	870.3	1010.2	75	38	56.3	-----	87	9	24	1	0	2	--	--	.33	-----	.19	6	1	T	0	-	-	--	-	-	5	11	14	6.1	—	253
Blue Canyon	5280	836.4	1012.6	57	40	48.4	-----	75	9	25	29	0	4	33	61	3.96	-----	2.33	6	4	18.0	13	9.3	WSW		--	--	3	12	15	7.1	—	488
Burbank	699	987.8	1014.0	69	51	59.6	-----	87	12	40	1	0	0	48	70	1.15	-----	.44	8	0	.0	0	6.4	S	38	NNW	29	6	9	15	6.6	-	161
Eureka CO	43	1014.2	1016.6	53	45	49.0	-.9	64	10	40	2	0	0	--	—	2.05	1.28	1.28	7	0	.0	0	6.4		25	N	29	1	7	22	8.5	26	474
Fresno	331	1001.7	1013.5	75	47	61.0	+.8	90	10	37	30	1	0	47	65	1.58	+.63	.95	4	1	T	T	6.6	NW	28	SW	29	10	8	12	5.7	84	146
Los Angeles CO	312	------	------	68	53	60.4	+1.0	81	12	47	1	0	0	--	—	1.54	+.50	.69	6	1	.0	0	6.1	--	32	NW	29	6	9	15	6.6	50	133
Los Angeles	99	1010.8	1014.5	64	53	58.3	-----	68	12	44	1	0	0	51	78	1.37	-----	.50	5	0	.0	0	6.2	WSW	-	—	—	5	9	16	7.0	-	193
Mt. Shasta CO	3543	890.3	1013.8	66	36	51.0	+4.6	81	13	26	1	0	8	36	60	1.93	-.69	1.75	6	5	T	T	7.6	ESE	-	-		9	8	13	6.0	-	415
Oakland	3	1015.2	1015.6	61	48	54.3	-.4	76	9	39	1	0	0	43	69	.95	-.57	.86	2	0	.0	0	7.4	W	--	---	-	2	5	23	8.3	--	312
Red Bluff	341	1000.3	1012.9	76	49	62.3	+2.3	96	9	36	1	5	0	42	53	.82	-.88	.62	4	3	T	T	7.9	SSE	51	SE	28	7	11	12	6.0	75	131
Sacramento CO	25	------	------	--	--	-- --	----	--	--			--	--	--	--	--			--	-			----	---	-	---	-	-				--	191
Sacramento	17	1012.5	1013.6	71	45	58.1	0	92	10	37	1	1	0	45	68	.69	-.82	.60	3	1	T	0	11.4	SW	34	SW	23	8	13	9	5.8	70	211
Sandberg CO	4517	860.1	1012.6	60	41	50.6	-----	79	9	28	29	0	3	33	63	.78	-----	.50	5	0	1.0	1	15.5	S	-	-	-	10	8	12	5.7	-	433
San Diego	19	1011.5	1014.6	66	55	60.7	+1.7	74	12	46	1	0	0	50	72	1.95	+1.18	.87	9	0	.0	0	7.0	W	34	SW	28	4	9	17	7.2	45	123
San Francisco CO	52	------	------	57	48	52.4	-2.6	68	8	45	1	0	0	--	--	.89	-.72	.86	2	0	.0	0	9.6	-	33	W	29	4	8	18	7.1	11	375
San Francisco	1	1014.9	1015.6	58	46	52.2	-.6	69	8	38	1	0	0	45	78	.66	-.64	.60	2	0	.0	0	10.3	W	36	WNW	29	3	5	22	7.8	-	373
Santa Catalina	1568	957.3	1014.1	60	47	53.5	-----	80	12	43	30	0	0	--	--	1.86	-----	.93	7	0	.0	0	----	----	--	--	--	6	5	19	7.2		341
Santa Maria	231	1007.1	1015.6	64	46	54.8	----	72	12	32	1	0	1	47	79	1.50	-----	.70	7	0	.0	0	6.0	W	21	WNW	29	2	10	18	7.6	-	300
COLORADO																																	
Alamosa	7534	767.1	1012.5	56	24	40.2	----	70	23	2	11	0	27	--	—	.45	-----	.32	5	3	2.8	1	---	---	-	---	--	6	16	8	5.7	—	739
olorado Springs	6175	807.0	1013.9	54	30	41.7	-----	75	23	13	11	0	19	24	57	.31	----	.13	10	5	1.3	T	13.9	N	--	---	--	5	8	17	6.9	-	695
Denver	5292	833.1	1012.3	56	32	43.8	-2.0	75	28	15	12	0	15	26	57	2.01	-.26	.97	15	2	12.9	8	8.4	NE	37	N	21	3	9	18	7.3	53	628
Grand Junction	4849	855.1	1010.2	65	39	51.7	-.7	78	23	20	11	0	4	25	40	.56	-.27	.28	8	3	.2	T	9.8	ESE	57	NW	21	7	8	15	6.4	65	391
ueblo	4799	853.0	1011.6	61	34	47.3	-2.1	84	23	17	11	0	14	27	52	.58	.73	.34	7	2	1.4	1	9.0	W	52	N	10	6	6	18	6.9	46	525
CONNECTICUT																																	
Bridgeport	7	1012.9	1013.6	59	42	50.4	-----	74	26	34	5	0	0	39	70	2.42	-- -	1.04	11	3	.0	0	10.6	SW	*34	NNW	3	8	11	11	5.9		430
Hartford	15	1007.1	1013.2	61	39	50.0	+3.3	76	29	31	17	0	5	39	70	2.34	-1.02	1.26	12	1	.0	0	9.3	SSW	37	W	15	7	8	15	[illegible]	52	441
ew Haven	6	1009.1	1013.2	59	41	49.7	+4.8	72	26	34	1	0	0	-	--	2.87	-.35	1.15	14	2	T	0	8.3	—	40	SE	12	8	10	12	[illegible]	66	451
DELAWARE																																	
Wilmington	73	1010.5	1013.6	63	40	51.6	-----	83	29	35	18	0	0	40	66	2.56	---	.91	12	3	.0	0	9.3	WNW	-	-	-	8	5	17	[illegible]		[illegible]
FLORIDA																																	
palachicola	13	1014.6	------	71	59	64.9	-2.2	80	27	45	1	0	0	--	--	3.20	+.40	1.22	6	4	.0	0	8.9	--	25	NW	12	13	9	8	4.6	75	66
Daytona Beach	33	1014.9	1016.5	77	56	66.2	-2.2	85	19	43	5	0	0	58	79	3.28	+1.36	1.94	8	4	.0	0	10.9	SW	50	S	19	14	4	12	5.4	—	49
ort Myers	15	1015.6	1015.9	83	60	71.3	-1.5	91	29	44	5	1	0	61	76	2.71	+.82	1.23	12	10	.0	0	8.6	E	--	--	-	11	11	8	5.2	—	6
acksonville	18	1015.6	1016.4	77	56	66.9	-1.1	86	23	42	1	0	0	51	69	1.23	-1.15	.47	4	3	.0	0	7.7	SW	41	S	16	11	8	11	5.1	62	15
ey West CO	5	1014.6	------	83	71	76.7	+1.0	87	20	61	15	0	0	-	--	2.00	+.71	1.16	10	5	T	T	8.5	—	26	NW	12	13	9	8	4.3	61	0
ey West	6	1014.9	1015.2	81	69	75.3	+.5	85	20	61	5	0	0	67	78	2.43	+1.14	1.66	8	5	T	T	12.0	E	—	—	--	12	12	6	4.9		6
akeland	214	------	------	78	60	68.6	-3.6	84	26	48	4	0	0	-	--	8.15	+5.85	3.53	11	6	.0	0	---				-	6	13	11	5.9		31
elbourne	22	1015.2	1016.6	78	61	69.4	-1.1	87	2	44	5	0	0	61	78	8.15	+5.87	2.55	10	5	.0	0	10.2	NE	25	NE	27	7	11	12	6.4		22
iami CO	180	-----	-----	78	67	72.5	-1.4	86	17	52	5	0	0	—	-	5.30	+1.89	2.77	9	6	.0	0	13.3	-	35	SE	7	7	11	9	5.7	60	3
iami	9	1014.6	1015.5	82	65	73.5	-----	89	17	54	4	0	0	63	73	4.79	-----	2.65	9	5	.0	0	9.4	E	36	S	20	10	11	9	5.6	--	2
iami Beach	----	------	------	79	69	74.1	-----	88	17	55	4	0	0	-	--	4.38	-----	1.89	10	-	.0	0	----	-	--			14	6	10	-		0
rlando	111	1012.2	1016.4	79	58	68.5	-2.8	85	2	44	5	0	0	58	74	5.99	+3.44	2.72	10	4	T	T	10.2	ENE	45	W	2	5	10	15	6.6	-	25
ensacola	13	1013.2	1015.5	73	58	65.1	-1.6	83	23	43	1	0	0	56		5.58	+1.55	1.55	11	5	.0	0	9.4	SE	23	SE	22	9	13	8	5.3	74	82
allahassee	64	1013.9	1016.2	77	55	66.0	-----	88	30	41	4	0	0	53	69	1.14	-- -	.53	6	4	.0	0	6.5	SE		--	-	12	10	8	4.9		75
ampa	24	1014.9	1016.2	79	60	69.6	-1.3	88	26	45	5	0	0	59	73	5.19	+3.18	3.70	9	5	.0	0	7.5	E	43	SW	2	6	12	12	6.0	51	19
est Palm Beach	14	1014.9	1015.6	82	64	72.8	-----	87	*2	49	5	0	0	64	77	1.90	+.89	1.56	11	7	T	T	9.1	E	-		-	6	13	11	5.7	-	6
GEORGIA																																	
lbany	190	1009.1	1016.2	76	54	65.0	-2.4	91	30	40	4	1	0	51	65	4.53	+.13	1.55	7	3	.0	0	5.9	SE	56	W	2	13	9	8	4.4		91
tlanta CO	---	------	------	69	50	59.8	-1.2	85	30	35	4	0	0	-	--	4.46	+.85	1.16	9	--	----	-	-	-	--	-	-	-					200
tlanta	977	973.6	1015.0	71	49	60.1	-1.0	85	30	35	4	0	0	45	63	4.88	+1.16	1.42	11	6	T	0	9.4	SE	42	NW	11	12	7	11	5.2	75	189
thens	798	986.1	------	71	48	59.5	-- --	86	30	33	4	0	0	--	--	3.30	-----	.80	10	3	.0	0	----	---				12	7	11	5.0		201
ugusta	126	1008.5	1015.1	75	49	62.0	-2.2	88	30	35	5	0	0	49	67	1.86	1.14	.61	8	3	.0	0	7.4	SE	*30	SW	2	12	10	8	[illegible]		133
olumbus	382	1001.4	1015.3	75	49	62.0	- -	90	30	34	4	1	0	50	68	3.66	- -	1.40	9	4	T	0	8.8	SE	-	-	-	14	6	10	[illegible]		155
acon	354	1002.0	1015.0	77	52	64.3	---	91	30	37	4	2	0	49	64	2.87	-----	.83	8	5	T	0	10.7	SE	40	NW	2	14	6	10	[illegible]	[illegible]	103
ome	637	994.2	1015.4	72	45	58.2	----	88	30	30	4	0	2	47	73	5.70	---	1.74	12	7	T	0	8.7	N		--		9	6	15	5.9		235
avannah	38	1013.2	1015.7	75	54	64.4	+.1	86	30	40	4	0	0	53	72	1.90	-.67	.81	6	4	.0	0	8.9	SW	30	SW	2	16	[illegible]	[illegible]	5.4	[illegible]	76
aldosta	200	1007.8	1015.8	78	54	65.7	-2.0	92	30	40	4	2	0	54	--	2.26	1.32	.92	7	3	.0	0	8.7	E				10	11	9	5.2		[illegible]
IDAHO																																	
oise	2842	916.4	1012.1	65	37	50.7	+1.6	76	13	24	21	0	4	30	19	.94	-.24	.76	3	0	T	[illegible]	8.3	NW	[illegible]	NW	20	17	[illegible]	8	4.3	[illegible]	422
ewiston	1413	963.4	1014.9	67	36	51.8	---	80	13	22	21	[illegible]	6	29	45	.45	--	[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	—		[illegible]	[illegible]	[illegible]	4.1		[illegible]
ocatello	4444	859.1	1011.8	61	33	46.9	+2.0	74	13	20	11	0	17	[illegible]	49	1.62	-.46	[illegible]	4	[illegible]	.9	1	[illegible]	[illegible]	[illegible]	SW	[illegible]	11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ILLINOIS																																	
airo CO	314	1000.3	1013.2	65	47	55.9	3.2	87	28	[illegible]	17	[illegible]	0	-	-	3.99	.27	[illegible]	12	3	T	0	9.9	[illegible]	[illegible]	[illegible]	[illegible]	5	[illegible]	[illegible]	[illegible]	[illegible]	311
hicago	618	986.5	1011.7	56	38	46.9	.0	84	30	29	16	0	1	36	73	4.62	+2.08	1.76	17	[illegible]	2.8	[illegible]	10.1	[illegible]	[illegible]	NW	[illegible]	[illegible]	[illegible]	[illegible]	7.9	[illegible]	[illegible]
oliet	580	993.2	1011.6	57	37	46.8	+.1	85	30	27	5	[illegible]	11	49	36	[illegible]	+.61	.96	11	3	2.0	[illegible]	11.3	[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	[illegible]	7.7	[illegible]	[illegible]
oline	589	989.5	1012.2	57	38	47.3	-1.5	83	29	27	5	0	16	[illegible]	72	3.60	+.91	1.16	[illegible]	[illegible]	1.4	[illegible]	12.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
eoria	659	989.5	1011.9	57	39	47.9	-2.0	83	30	27	17	0	9	35	73	4.09	+.71	1.41	13	5	2.1	1	12.2	WNW	45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	528
pringfield CO	----	------	------	--	--	----	----	--	--	--	--	-	--	--	-	----	----				- -			- -									
pringfield	593	988.2	1011.8	58	39	48.7	-1.6	87	28	27	4	0	11	39	74	5.09	+1.58	2.50	[illegible]	5	1.9	1	14.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F	°F.	°F	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	997.6	1013.3	63	43	52.7	-2.2	88	30	28	17	0	3	42	71	3.51	-0.39	1.27	12	3	T	0	11.9	SW	36	SW	12	4	8	18	7.1	58	401
Fort Wayne	801	982.1	1012.6	56	38	46.8	-1.9	81	28	28	20	0	8	39	79	3.73	+.66	.83	15	2	T	T	9.8	W	41	NW	28	3	4	25	8.0	46	550
Indianapolis CO	---	---	---	--	--	---	---	--	--	--	--	-	--	--	--	---	---	---	--	-	---	--	---	---	--	---	--	--	--	--	---	—	475
Indianapolis	796	983.1	1012.8	58	39	48.1	-2.4	83	30	27	17	0	7	40	76	3.26	-.36	.88	19	3	.1	T	12.5	W	55	SW	25	4	6	20	7.6	41	512
South Bend	768	983.1	1011.7	55	36	45.7	-2.1	82	28	28	20	0	13	37	78	4.75	+1.70	1.75	17	4	1.7	1	12.3	WNW	°35	WNW	28	4	5	21	8.1	—	582
Terre Haute	585	991.9	1013.1	59	39	49.1	-3.4	84	30	26	17	0	8	40	73	3.63	-.03	.57	15	1	1.3	0	10.8	NW	40	S	25	3	10	17	7.3	46	491
IOWA																																	
Burlington	605	986.1	1011.9	57	38	47.8	-3.6	85	30	27	17	0	12	38	73	2.50	-.70	.94	14	3	.4	1	12.0	NW	38	NW	12	2	8	20	7.9	45	529
Charles City CO	1013	975.6	1012.9	49	34	41.8	-4.6	79	30	23	3	0	15	--	--	6.18	+3.66	2.91	16	3	.4	1	7.6	---	24	S	29	5	6	19	7.4	33	692
Davenport CO	579	989.8	------	56	39	47.7	-2.2	83	29	30	16	0	7	--	--	4.11	+1.42	1.42	9	5	.9	2	----	--	--	---	--	--	--	--	---	—	555
Des Moines	800	981.4	1012.7	54	37	45.8	-3.9	82	28	27	1	0	11	37	75	5.20	+2.29	1.07	17	5	T	T	14.1	NW	44	NW	14	3	6	21	8.1	39	587
Dubuque	641	971.9	1011.4	53	34	43.5	-----	78	30	22	17	0	14	35	77	4.34	----	1.04	11	3	.2	T	11.6	NW	°33	SSE	29	4	8	18	7.4	—	639
Sioux City	1097	971.6	1013.2	54	34	43.9	-3.3	81	28	24	16	0	18	35	76	4.35	+1.65	1.01	14	5	2.2	2	13.1	NNW	38	NW	14	4	5	21	7.6	47	630
KANSAS																																	
Concordia CO	1375	962.8	1012.9	58	40	49.1	-4.4	86	28	28	16	0	6	--	62	4.74	+2.38	1.52	10	5	T	T	11.5	---	35	NW	12	8	5	17	6.6	45	485
Dodge City	2594	923.8	1011.7	63	37	49.9	-3.7	90	28	25	13	1	13	33	58	1.56	-.38	.68	8	5	1.8	T	16.1	N	52	N	11	9	9	12	5.9	62	459
Goodland	3645	884.9	1012.5	59	30	44.8	-5.0	86	28	16	16	0	19	27	61	1.60	-.23	.69	9	3	2.2	2	14.7	N	°40	S	30	7	11	12	6.1	—	601
Topeka CO	----	------	------	--	--	----	-----	--	--	--	--	-	--	--	--	----	-----	----	--	-	----	--	----	---	--	---	--	--	--	--	---	—	452
Topeka	926	980.4	1012.6	61	40	50.5	-----	88	28	27	3	0	9	39	69	3.08	-----	1.27	14	6	T	T	13.5	NW	42	S	17	5	8	17	7.4	38	462
Wichita	1372	963.1	1011.7	61	42	51.9	-4.5	85	28	30	16	0	2	37	63	6.33	+3.42	2.63	13	6	T	T	17.5	NNW	45	SW	20	7	7	16	6.4	62	408
KENTUCKY																																	
Lexington	979	978.0	1014.0	62	41	51.7	-2.6	85	30	27	17	0	6	41	69	2.49	-1.01	.52	14	2	1.0	1	12.6	SSW	--	---	--	4	9	17	7.3	—	425
Louisville CO	----	------	------	--	--	----	-----	--	--	--	--	-	--	--	--	----	-----	----	--	-	----	--	----	---	--	---	--	--	--	--	---	—	374
Louisville	485	997.0	1013.2	63	43	53.4	-1.4	88	30	30	17	0	2	41	66	2.88	-1.00	.63	14	1	T	0	11.2	SW	40	S	12	3	11	16	7.3	51	389
LOUISIANA																																	
Baton Rouge	64	1015.2	1014.6	75	54	64.8	-3.1	84	22	41	3	0	0	54	76	2.23	-2.16	.99	7	2	.0	0	8.1	SE	--	---	-	12	11	7	4.8	—	91
Lake Charles	12	1012.9	1014.2	76	55	65.3	-2.1	85	30	43	17	0	0	55	77	1.18	-3.18	.56	9	3	.0	0	10.6	SE	--	--	--	10	9	11	5.2	—	77
New Orleans CO	12	1012.9	------	76	59	67.4	-1.4	86	22	47	12	0	0	-	--	5.50	+.26	2.16	10	3	.0	0	7.2	--	21	E	16	11	13	6	4.0	61	49
New Orleans	12	1013.9	1014.7	76	57	66.5	-----	86	22	43	4	0	0	56	77	7.79	-----	2.58	10	7	T	0	9.7	S	°40	S	16	11	12	7	4.9	—	68
Shreveport	174	1004.4	1013.3	75	52	63.5	-2.7	87	30	35	3	0	0	50	69	1.82	-2.81	.74	9	1	.0	0	11.9	SSE	35	W	12	10	12	8	5.2	61	126
MAINE																																	
Caribou	624	988.5	1011.9	49	34	41.1	+5.5	65	28	26	22	0	15	34	80	4.50	+1.73	.81	17	0	.8	4	12.6	N	°38	NW	30	1	4	25	8.7	--	709
Eastport	33	1008.5	1011.5	49	38	43.4	+1.4	60	28	34	*18	0	0	--	--	5.21	+2.40	1.24	19	2	T	0	11.3	---	12	E	3	2	9	19	8.0	36	639
Portland	61	1007.8	1011.8	54	37	45.6	+5.5	71	29	25	22	0	6	38	76	5.26	+1.38	1.68	18	1	T	T	10.3	NW	40	S	22	3	11	16	7.2	51	574
MARYLAND																																	
Baltimore CO	14	------	------	65	47	55.5	+1.9	86	29	37	18	0	0	--	--	3.63	+.29	1.14	10	-	----	--	----	---	--	---	--	--	--	--	---	—	295
Baltimore	146	1009.5	1014.1	65	43	53.8	-----	86	29	32	18	0	1	40	62	3.69	----	1.25	10	3	.0	0	12.6	W	42	SE	12	7	6	17	6.6	41	338
Frederick	294	------	------	65	40	52.4	-----	83	29	28	18	0	5	--	--	2.72	----	.63	13	1	.0	0	----	---	--	---	--	--	--	--	---	—	390
MASSACHUSETTS																																	
Boston	12	1007.8	1012.6	59	43	51.0	+4.6	74	29	37	4	0	0	37	64	3.06	-.28	1.54	12	2	T	T	13.2	WNW	[illegible]	SW	15	5	16	9	6.1	58	416
Nantucket	43	1012.5	1013.1	54	40	47.1	+3.7	63	26	34	9	0	0	40	79	2.17	-.79	.64	8	1	.0	0	12.7	WSW	43	SE	3	6	12	12	6.1	55	532
Pittsfield	1153	969.9	1012.5	55	35	44.9	+4.0	70	29	26	1	0	11	--	--	3.58	+.48	1.27	18	1	4.3	3	10.0	---	--	---	--	6	8	16	6.9	—	598
MICHIGAN																																	
Alpena CO	587	988.8	1011.5	47	35	40.9	+2.3	82	28	28	20	0	15	--	--	3.32	+1.08	1.16	17	0	1.3	T	11.0	---	32	SE	18	4	8	18	7.5	49	720
Detroit	619	984.8	1012.0	54	38	46.0	+.4	81	28	30	20	0	3	35	70	2.71	+.25	.65	12	2	.2	T	9.8	NW	34	NW	19	3	5	22	8.1	35	562
Escanaba CO	594	988.8	1011.5	46	33	39.5	+1.6	69	28	25	17	0	14	--	--	2.70	+.47	1.05	11	2	4.5	2	10.9	---	31	N	15	4	6	20	7.7	54	759
Grand Rapids CO	----	------	------	--	--	----	-----	--	--	--	--	-	--	--	--	---	----	----	--	-	----	--	----	---	--	---	--	--	--	--	---	—	565
Grand Rapids	638	985.4	1011.8	54	36	44.6	+.1	79	28	24	20	0	12	35	76	1.25	+1.48	1.07	16	1	5.7	3	9.9	W	35	S	18	3	5	22	8.1	47	609
Lansing	859	979.3	1011.7	53	36	44.4	-.9	80	28	27	20	0	14	35	75	[illegible]	+.35	.61	16	1	1.0	1	14.4	W	38	SE	11	2	7	21	8.2	40	612
Marquette CO	677	984.4	[illegible]	45	[illegible]	38.7	+.9	78	28	24	[illegible]	[illegible]	16	--	--	[illegible]	+1.98	2.12	13	1	23.5	10	7.6	---	25	S	27	2	8	20	8.0	43	782
Muskegon	627	987.8	1011.4	51	35	43.1	-.6	75	29	[illegible]	[illegible]	[illegible]	11	34	76	[illegible]	+2.26	1.30	15	2	1.9	1	9.6	WNW	°35	WSW	14	4	5	21	7.9	—	650
Sault Ste. Marie	721	988.5	1011.6	48	32	40.3	+3.8	[illegible]	28	[illegible]	18	[illegible]	20	31	76	[illegible]	+.41	1.10	11	1	4.5	1	9.9	NW	30	SE	28	3	8	19	7.6	41	732
Ypsilanti	722	983.1	1011.9	55	36	45.7	-----	81	28	[illegible]	16	[illegible]	6	36	73	[illegible]	--	.60	15	4	1.5	T	11.3	W	°30	E	21	2	1	24	8.2	-	575
MINNESOTA																																	
Duluth CO	----	------	------	--	--	----	-----	-	-	-	-		--	--	--	---	- - -	----	-	--	- -	-						-	--		-	-	793
Duluth	1128	960.4	1013.0	45	29	37.0	-----	73	28	13	7	0	23	28	75	2.11	-----	.82	10	2	8.0	25	15.1	NW	49	W	22	5	5	26	7.5	50	830
Intern'l Falls	1179	969.5	1013.5	45	27	35.6	2.6	71	30	15	1	0	26	28	75	1.31	-.43	.43	13	0	5.3	22	---	---	-	--	--	8	5	17	6.7	--	874
Minneapolis	[illegible]	978.7	1013.0	50	35	42.3	-4.1	79	28	24	[illegible]	0	12	31	70	1.86	-.37	.81	11	1	2.6	6	12.1	WNW	34	W	22	1	5	21	7.7	56	675
Rochester	1014	974.9	1012.6	49	33	40.7	1.0	81	28	20	17	0	16	33	78	3.98	+1.62	1.50	15	1	1.0	6	11.1	WNW	--	-	--	1	5	21	8.0	-	724
St. Cloud	1034	974.6	1013.1	49	31	40.1	1.3	77	28	19	17	0	19	31	75	2.26	+.14	.75	10	3	2.6	8	9.6	WNW	-	-		6	6	18	7.3		738
St. Paul	703	986.5	1012.5	50	35	42.3	-3.3	80	[illegible]	24	[illegible]	0	13	31	70	1.92	-.43	.75	13	1	.5	2	11.6	NW	30	SE	27	4	4	22	7.7	-	675
MISSISSIPPI																																	
Jackson	315	1002.7	1014.6	75	51	62.8	-2.4	89	27	37	17	0	0	50	67	5.46	+.13	3.47	12	6	.0	0	9.9	SSE	32	NW	19	10	10	10	5.0	62	112
Meridian	291	1001.4	1014.9	76	49	62.3	-.6	88	27	32	17	0	1	50	69	3.30	-1.48	1.00	7	5	.0	0	7.5	SW	-	---	--	16	10	10	5.2	-	152
Vicksburg	234	1006.8	------	73	53	62.8	-2.8	86	28	40	3	0	6	--	-	5.55	+.36	3.40	11	6	.0	0	9.2	--	26	W	12	11	9	10	5.3	65	135
MISSOURI																																	
Columbia	733	983.7	1012.1	60	41	50.6	-3.0	88	28	29	16	0	6	38	70	2.32	-1.45	.59	12	4	.5	T	[illegible]	WNW	[illegible]	NW	16	6	7	[illegible]	7.1	51	458
Kansas City	711	977.3	1012.1	[illegible]	42	51.3	-3.5	86	27	31	[illegible]	0	6	38	66	2.87	-.65	1.07	13	3	1.0	1	11.7	NW	39	NW	12	[illegible]	[illegible]	[illegible]	7.1	46	439
St. Joseph	809	977.0	1012.0	59	40	49.4	-4.1	87	28	26	3	0	9	38	71	4.34	+1.15	2.33	11	4	1.5	2	14.0	NW	51	SW	[illegible]	1	9	17	7.2	42	485
St. Louis CO	[illegible]	---	-----	61	44	52.7	[illegible]	90	28	32	12	1	1	--	--	1.93	-1.88	.58	8	3	T	T	13.2	--	33	SE	[illegible]	1	12	14	6.9	56	410
St. Louis	465	991.5	1012.1	62	42	52.1	[illegible]	91	28	31	17	1	1	39	68	2.46	1.16	.93	8	2	T	0	10.5	W		-	--	1	10	16	7.5	—	427
Springfield	1265	961.8	1012.5	61	41	51.4	.8	86	27	28	17	0	6	40	73	2.47	1.39	.76	12	1	1.7	T	17.0	SSE	50	[illegible]	11	5	6	19	7.2	49	429
MONTANA																																	
Billings	3568	889.3	1014.7	54	30	42.0	[illegible]	76	28	11	19	0	19	21	[illegible]	.88	--	.36	6	0	6.1	2	10.7	NNE	42	NW	[illegible]	[illegible]	[illegible]	[illegible]	6.1	63	685
Butte	5530	827.0	1016.3	51	23	36.8	-2.3	65	13	7	19	0	29	21	57	.90	.16	.75	7	0	12.9	10	10.9	NW	-			12	[illegible]	1	5.8		810
Glasgow CO	2090	941.4	1016.4	[illegible]	27	40.1	-4.4	[illegible]	29	11	19	0	25	25	60	1.69	+.71	.78	1	2	8.1	8	-	---	--	-	-	7	[illegible]	12	6.0	-	712
Great Falls	[illegible]	887.6	1015.8	55	29	40.8	-4.9	70	26	6	19	0	18	21	51	2.50	+1.35	2.43	7	0	5.5	1	11.6	SW	15	NW	[illegible]	9	7	14	6.0	63	720
Havre CO	[illegible]	[illegible]	1016.6	55	27	41.4	[illegible]	76	29	8	19	0	22		--	.73	-.26	.36	4	1	1.1	1	[illegible]	---	53	NW	7	13	1		5.2	75	701
Helena	[illegible]	872.0	1016.0	54	27	[illegible]	-2.9	69	28	7	19	0	21	25	56	1.58	+.46	1.25	7	0	5.5	2	[illegible]	W	11	W	13	10	5	[illegible]	[illegible]	70	725
Kalispell	2965	910.3	1014.6	56	28	42.2	-	68	26	10	19	0	21	25	54	2.04	--	1.74	4	0	6.2	5	9.8	NE		-	--	11	[illegible]	[illegible]	[illegible]	-	676
Miles City	2629	930.6	1016.0	54	27	40.6	-	[illegible]	29	11	22	0	21	26		.67		.26	5	2	3.7	2	10.6	NNW			-	7	8	15	6.5	--	721
Missoula	3201	900.4	1015.5	59	29	[illegible]	.2	76	12	11	19	0	21	25	55	2.25	+1.35	[illegible]	5	0	6.1	1	6.5	N	12	N	18	11	5	11	5.1	65	633
NEBRASKA																																	
Grand Island	1841	945.8	1012.4	56	[illegible]	[illegible]	[illegible]	82	28	25	[illegible]	[illegible]	[illegible]	[illegible]	64	3.70	----	1.55	12	5	T	0	17.5	NNW		-	-	6	7	17	7.1	-	576
Lincoln CO	1184	1003.4	----	56	[illegible]	[illegible]	[illegible]	87	28	26	16	[illegible]	[illegible]		-	4.16	+1.63	1.32	11	6	.8	1	12.4	-	16	NW	12	-	-	-		11	518
Lincoln	1180	1003.4	1012.8	56	[illegible]	46.0	[illegible]	[illegible]	28	26	[illegible]	[illegible]	12	[illegible]	72	1.72	+2.10	1.31	12	5	.7	1	15.8	NNW		-		6	7	17	7.1	--	573
Norfolk	1554	957.3	1013.6	[illegible]	[illegible]	43.8	[illegible]	[illegible]	[illegible]	25	16	[illegible]	16		71	3.65	+.94	1.19	16	6	[illegible]	T	18.7	NNW		- - -		6	5	19	7.1	—	[illegible]
North Platte	[illegible]	913.3	1012.7	57	[illegible]	44.0	[illegible]	84	28	17	16	[illegible]	[illegible]	[illegible]	59	2.18	+.12	1.16	8	[illegible]	T	T	15.0	N	52	N	10	9	6	15	6.0	55	623
Omaha	978	[illegible]	1012.7	55	[illegible]	46.1	[illegible]	86	28	28	1	0	1	[illegible]	[illegible]	6.45	+3.94	1.60	12	7	1.1	1	15.1	NNW	47	NW	12	5	6	19	7.5	38	573
Scottsbluff	3950	876.4	1013.8	56	27	41.1	[illegible]	[illegible]	[illegible]	[illegible]	16	[illegible]	[illegible]	[illegible]	[illegible]	1.70	.36	.59	12	3	1.1	1	10.0	NNW	--	-		8	8	11	6.2		702
Valentine CO	[illegible]	921.4	1011.2	53	31	41.9	[illegible]	80	28	12	16	0	[illegible]		--	[illegible]	.17	.57	5	3	2.8	3	11.6	---	[illegible]	SE	[illegible]	1	10	16	6.8	71	691

See footnotes at end of table.

CLIMATOLOGICAL DATA

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Departure from normal	Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Max depth on ground	Wind: Average hourly speed	Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft	Mb	Mb.	°F	°F	°F	°F.	°F.		°F				°F	%	In.	In.	In			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
NEVADA																																	
lko	5075	841.9	1012.7	62	30	46.3	--- -	75	13	18	11	0	23	32	61	0.51	— -	0.29	5	3	0.7	T	7.3	NW	—	---	--	9	5	16	6.4	—	553
ly	6257	805.6	1012.2	59	28	43.5	+3.1	70	13	14	11	0	21	-	--	.94	-.12	.25	11	1	4.3	4	11.0	---	59	S	28	3	12	15	7.1	65	641
as Vegas	2162	933.6	1008.9	78	50	64.1	+2.5	90	14	39	1	2	0	21	30	.04	-.22	.03	2	1	.0	0	7.2	SW	--	---	--	14	7	9	4.6	81	84
eno	4397	859.1	1012.1	67	32	49.7	+3.6	80	13	19	1	0	15	29	50	1.07	+.60	.52	7	1	T	T	5.7	WNW	42	S	28	7	11	12	6.3	73	452
innemucca	4299	864.9	1012.3	63	32	49.1	+2.4	80	13	20	11	0	17	27	45	1.05	+.21	.17	4	1	T	T	8.3	--	34	NW	28	7	7	16	6.3	75	471
NEW HAMPSHIRE																																	
oncord	339	1001.4	1012.2	57	34	45.7	+4.1	71	29	24	21	0	11	35	69	5.10	+2.32	1.63	15	3	T	T	6.5	NW	40	W	26	4	12	14	6.8	46	574
lt. Washington	6262	798.5	1014.6	29	19	24.1	+.7	41	29	11	21	0	30	--	92	5.67	-1.28	1.48	26	0	29.3	27	33.9	W	101	W	26	2	2	26	8.9	16	1225
NEW JERSEY																																	
tlantic City	8	1011.9	1013.9	58	45	51.5	+3.7	83	26	36	17	0	0			1.80	-1.19	1.03	5	0	.0	0	16.4	—	42	SE	12	11	6	13	5.7	66	404
ewark	11	1012.2	1013.3	62	43	52.6	+2.4	86	29	35	17	0	0	38	61	3.12	-.60	1.01	11	2	.0	0	11.3	SW	50	W	15	7	11	12	6.1	--	369
renton	56	1006.8	1013.5	62	43	52.2	+2.4	84	29	35	17	0	0	-	--	2.40	-.54	.81	13	3	.0	0	9.7	-	34	SW	15	8	8	14	6.1	66	380
NEW MEXICO																																	
lbuquerque	5310	842.9	1008.7	69	41	54.8	+.8	81	23	24	11	0	5	22	34	.38	-.22	.36	4	1	T	T	11.0	SE	54	S	29	9	14	7	5.2	71	301
layton	4969	843.9	1011.0	64	33	48.1	-3.2	82	24	16	11	0	14	30	57	.46	-1.21	.27	6	3	.3	T	17.4	SSW	--	—	--	7	13	10	6.1	—	499
aton	6379	800.9	1010.8	60	29	44.1	-----	74	24	7	11	0	22	21	53	1.08	-----	.43	9	5	4.7	4	11.3	SSW	--	---	--	4	14	12	6.4	—	620
oswell	3611	887.6	1010.2	75	41	58.0	-2.6	92	24	25	11	1	4	26	34	.41	-.45	.31	2	1	T	0	12.4	SSE	61	SW	29	17	7	6	3.6	84	226
NEW YORK																																	
lbany	277	1008.8	1012.2	58	38	47.7	+3.3	70	27	30	1	0	6	36	68	2.38	+.22	.87	14	1	1.4	1	9.5	WNW	42	W	15	5	7	18	7.1	51	514
ear Mountain	1306	------	------	56	39	47.7	---	77	29	31	17	0	3	--	-	2.94	---	1.11	14	3	T	T	----	---	-	---	--	7	9	14	6.1	—	512
inghamton CO	858	-----	------	58	38	47.9	+2.6	75	29	30	6	0	4	-	-	2.33	-.15	.64	16	4	T	T	7.1	---	31	SW	15	4	5	21	7.8	45	507
inghamton	828	981.7	1012.7	57	36	46.3	-----	74	29	26	21	0	10	36	70	2.54	-----	.66	14	4	T	0	7.1	WSW	--	---	--	3	6	21	7.9	—	554
uffalo	693	983.7	1012.8	53	37	45.0	+1.2	72	8	30	21	0	4	37	77	4.03	+1.47	.98	18	3	T	T	15.0	SW	47	SW	15	6	2	22	8.0	38	592
ew York CO	10	1001.4	1012.9	60	45	52.2	+2.8	80	29	36	17	0	0	--	--	2.09	-1.14	.80	10	1	.0	0	15.6	—	68	W	29	9	9	12	5.8	65	378
ew York	19	1011.5	1013.3	62	45	53.6	-----	83	29	39	17	0	0	39	62	2.56	-----	.73	10	1	.0	0	12.9	SW	57	NW	3	7	8	15	6.1	--	339
swego	292	999.3	1011.9	51	39	44.8	+2.2	66	29	32	6	0	1	--	--	3.98	+1.64	1.09	19	2	T	0	9.2	---	29	W	15	6	4	20	7.1	43	600
ochester	543	992.9	1012.4	54	38	45.7	+.8	72	29	29	20	0	5	37	75	3.55	+1.20	1.06	18	1	T	0	12.4	WSW	55	SW	15	6	4	20	7.6	33	573
yracuse	399	990.5	1012.5	54	39	46.5	+3.5	70	29	29	6	0	3	37	71	3.79	+1.32	.85	19	1	T	T	11.7	WSW	43	W	22	5	3	22	7.7	42	547
NORTH CAROLINA																																	
sheville CO	2203	----	------	65	43	54.2	+.3	82	30	30	18	0	2	--	--	2.62	-.40	.63	12	5	T	0	9.3	---	30	W	12	8	10	12	6.0	58	332
sheville	2093	------	1014.7	--	—	----	-----	-		--	--	-	--	41	71	---	----	----	--		----	--	7.8	NNW	--	---	--	-	--	--	---	-	360
harlotte CO	741	987.1	------	71	50	60.4	+.6	87	30	40	4	0	0	--	--	4.16	+.85	1.48	11		T	T	--	--	30	SW	13	9	9	12	5.6	68	168
harlotte	753	987.5	1014.7	71	48	59.6	+1.5	89	30	37	4	0	0	44	61	4.08	+.77	1.50	11	2	T	0	9.6	SW	--	--	--	9	9	12	5.6	—	187
reensboro	891	983.1	1015.0	69	44	56.5	+.2	87	30	32	5	0	2	43	66	4.16	+.59	1.25	14	2	T	T	9.9	SW	34	N	3	9	10	11	5.9	60	270
atteras	4	1014.6	1015.2	67	54	60.4	+.6	76	30	44	7	0	0	52	75	4.51	+.97	1.90	11	5	.0	0	13.8	SSW	38	SW	16	13	8	9	4.9	74	145
aleigh CO	400	------	------	72	48	60.0	+.6	89	30	37	18	0	0	-	--	3.81	+.34	1.43	10	-	.0	0	----	—	32	SW	12	12	13	5	4.6	64	179
aleigh	438	999.0	1014.8	71	46	58.4	-----	89	30	35	11	0	0	41	61	4.19	-----	1.50	12	6	.0	0	9.1	SW	--	---	--	10	14	6	5.3	--	222
ilmington CO	6	1014.2	1015.1	71	54	62.2	+.2	87	30	42	18	0	0	--	--	6.06	+3.40	3.39	9	4	.0	0	10.2	---	36	SW	13	11	14	5	4.8	63	108
ilmington	30	------	1015.4	--	—	----	-----	--	-	--	—	-	--	51	--	----	-----	----	—	-	----	--	7.7	SW	--	---	--	--	--	--	---	—	112
inston-Salem	967	979.7	1014.8	68	46	57.1	+.2	88	30	32	18	0	1	41	58	3.97	+.52	1.30	12	5	.0	0	11.6	WSW	--	---	--	8	13	9	5.6	--	253
NORTH DAKOTA																																	
ismarck	1653	954.3	1015.8	52	29	40.3	-.1	84	29	18	16	0	24	30	71	.48	-1.04	.23	7	0	2.3	2	12.0	NNW	56	SE	29	7	9	14	6.5	61	738
evils Lake CO	1471	961.1	1015.6	48	28	38.2	-.6	77	29	20	22	0	24	--	--	.56	-.96	.21	6	1	2.6	2	10.3	---	29	N	14	13	4	13	5.2	61	797
argo	895	979.3	1014.3	49	31	40.3	-.3	79	29	20	22	0	22	32	75	.46	-1.72	.27	7	0	2.0	1	15.1	NNW	50	SE	[illegible]	8	9	13	[illegible]	50	735
illiston CO	1877	947.2	1016.0	50	28	39.3	-2.7	82	29	18	22	0	25	25	62	.68	-.52	.37	4	2	3.1	3	8.1	---	35	NW	[illegible]	9	8	13	6.1	68	765
OHIO																																	
kron	1210	968.2	1013.3	56	35	45.4	-2.5	80	29	25	20	0	17	36	71	3.89	+.88	.80	19	3	.1	T	9.8	W	--	---	-	[illegible]	[illegible]	[illegible]	8.1		582
incinnati CO	553	989.8	------	63	44	53.5	-.8	87	29	34	17	0	0	--	-	2.55	-.57	.69	12	1	T	T	---	---	34	W	12	-			---	40	381
incinnati	871	981.0	1012.9	60	42	50.7	-----	86	30	29	17	0	1	40	69	2.58	-----	.70	12	1	T	T	12.5	SSW	--	---	--	4		-	7.6	—	455
leveland CO	----	------	-----	--		---	-----	-	--	-	--	-	--	--	-	---	-	-	-	-	—	-	-	-	----	-	-	-	--	---	—	536
leveland	787	985.1	1012.7	57	37	46.8	+.6	81	28	26	20	0	5	37	71	2.69	+.25	.60	17	2	.6	T	12.1	W	65	W	28	5	[illegible]	21	7.9	33	540
olumbus CO	724	------	------	59	41	50.1	1.1	83	30	31	17	0	2	--	--	2.94	+.07	.83	16	2	T	0	10.9	---	42	SW	25	3	9	18	7.6	45	464
olumbus	815	982.7	1013.2	60	39	49.2	-.1	84	29	29	20	0	8	39	71	3.00	+.13	.92	15	2	T	T	10.1	SW	27	NW	28	4	6	20	7.6	—	485
ayton	1002	976.3	1012.9	58	39	48.3	-2.2	81	28	29	2	0	9	39	72	2.30	.90	.47	15	3	T	0	13.8	SE	40	SW	25	3	3	24	7.9	45	515
andusky	603	989.8	------	55	39	47.2	0	84	28	32	18	0	1	--	--	2.41	-.14	.50	15	3	T	0	9.3	---	46	S	28	3	6	21	7.9	49	531
oledo	621	988.8	1012.2	55	37	46.1	-.1	83	28	28	5	0	6	38	75	3.01	+.36	1.12	15	3	T	T	12.3	WSW	40	SW	28	2	3	25	8.6	36	564
oungstown	1178	970.5	1013.0	56	36	45.6	-1.5	80	28	26	18	0	13	36	74	3.61	+.78	.98	13	4	.9	T	10.7	WSW	50	NW	29	4	7	19	7.5	—	578
OKLAHOMA																																	
klahoma City CO	----	-----	------	--	--	---	----	-	--	--	-	-	--	--	--	----	----	--	--	-	----	--	----	---	--	---	-	--	--	-	---	—	255
klahoma City	1254	965.8	1012.2	68	46	57.1	-2.7	88	18	30	12	0	1	40	58	3.02	-.27	1.68	5	4	T	0	21.2	SSE	70	S	24	8	13	9	5.3	70	269
ulsa	672	988.2	1012.1	68	46	56.9	-2.0	87	27	33	3	0	0	42	63	2.57	-1.62	.95	9	6	T	0	14.5	S	38	NW	8	11	4	15	5.8	55	275
OREGON																																	
aker	3369	------	- ----	--	--	----	----	-		--	-	-	--	27		-	-	---	--	-	-	--	7.5	NNW	-	---	--	--	-	-	--	—	---
aker CO	3446	893.3	1015.2	62	32	46.6	+1.4	77	13	18	21	0	18	-	--	.57	.52	.57	2	0	T	0	7.2	-	26	SW	27	16	6	18	4.1	79	544
urns CO	4140	871.0	1013.6	61	34	48.7	+1.1	77	13	20	21	0	10	25	43	1.06	+.53	.97	3	0	T	T	--	—		---	--	17	6	7	3.8	—	483
ugene	364	1002.1	1016.2	68	39	53.4	- -	83	11	30	1	0	3	40	65	.55	----	.23	4	0	T	T	8.4	N	--	--	-	13	8	9	4.7	—	342
eacham	4050	875.0	1016.3	55	32	43.2	- -	71	12	21	21	0	16	27	54	1.24	--	1.07	4	0	1.2	4	5.9	WNW	--	---	—	14	5	11	4.7	--	645
edford	1314	966.1	1014.0	73	41	57.0	+1.9	89	12	29	1	0	1	40	58	.73	-.60	.55	5	0	.0	0	6.2	N	30	NNW	20	10	8	12	5.8	—	238
endleton	1489	961.7	1015.5	65	39	52.1	+1.3	86	13	26	21	0	2	29	45	1.02	-.03	.81	3	1	.0	0	9.3	SE	--	--	--	16	5	9	4.0	—	379
ortland CO	30	-- --	------	67	46	56.2	+4.4	83	12	39	21	0	0	--	--	1.24	-1.63	.62	3	-	.0	0	- --	---	--	--	--	--	-	-	---	—	259
ortland	21	1014.9	1016.4	66	41	53.5	+3.3	81	12	29	21	0	2	38	60	1.14	-----	.84	4	1	.0	0	5.1	NW	28	E	11	12	10	8	4.9	65	337
oseburg CO	179	996.6	1015.6	69	41	55.4	+4.4	86	11	31	21	0	1	-	--	.93	-1.34	.46	4	0	T	0	4.4	---	17	N	*9	10	7	13	5.8	74	232
alem	195	1008.5	1016.0	68	37	52.5	+1.2	84	12	26	21	0	5	38	63	.98	-1.46	.62	4	0	T	0	6.3	S	--	---	-	15	6	9	4.3	—	366
eaton Summit CO	3856	- --	-	61	40	50.4	- - -	72	12	28	[illegible]	0	3	--	--	.91		.80	4	1	.3	T	----	---	--	---	--	7	7	16	6.4	—	433
outdale	29	---	------	68	42	54.7	--- -	83	12	32	5	0	1	- -	--	1.59	----	1.19	4	0	.0	0	----	—	-	---	--	11	9	10	5.0	--	306
PENNSYLVANIA																																	
llentown	381	999.3	1013.7	60	39	49.8	+1.1	82	29	31	17	0	2	39	68	3.15	+.05	1.15	11	3	T	0	9.8	W	--	---	--	7	8	15	6.4	--	451
rwensville	2215	------	------	54	33	43.5	- --	79	29	21	20	0	18	34	74	5.42	- ---	1.15	19	6	5.0	T	11.8	WNW	36	W	15	4	7	19	7.5	—	642
rie	655	--- --	----	53	39	46.3	+1.2	76	25	32	18	0	1	--	--	4.28	+1.55	.89	18	3	.4	T	8.6	---	29	SW	15	6	10	14	6.5	44	558
arrisburg	335	999.3	1013.3	61	42	51.6	+.7	83	29	31	21	0	0	37	59	1.35	-1.34	.50	14	2	T	0	9.4	W	44	SE	12	6	5	19	6.9	57	400
ark Place	1932	- ----	------	55	36	45.3	-----	80	29	26	17	0	9	--	--	3.18	-----	1.09	14	3	.1	T	----	---	--	---	--	7	5	18	6.9	--	588
hiladelphia CO	26	------	------	63	45	54.1	+2.0	83	29	38	17	0	0	--	-	2.38	-.67	1.05	10	--	.0	0	8.6	---	29	SE	12	8	6	16	6.3	62	328
hiladelphia	13	1012.5	1013.5	64	43	53.6	+3.0	85	29	36	17	0	0	39	62	2.49	-.56	1.01	9	0	.0	0	11.0	WSW	35	WNW	15	5	8	17	6.8	—	342
ittsburgh CO	749	------	------	60	41	50.9	-.1	83	28	32	17	0	1	-	--	4.87	+1.95	.94	16	-	.6	—	----	---	--	---	--	—	-	—	---	38	411
ittsburgh	1248	982.7	1013.3	59	40	49.2	0	81	28	28	17	0	3	36	66	4.86	+1.94	.71	18	4	5.2	1	10.1	WSW	34	W	15	3	6	21	7.9	38	484
eading	266	1001.4	1013.5	63	43	53.0	+2.2	85	29	36	17	0	0	-		3.81	+.54	1.61	12	3	.0	0	12.8	---	43	E	12	6	8	16	6.6	60	362
cranton	746	984.1	1013.5	59	40	49.5	+1.4	80	29	32	21	0	1	--	--	2.43	-.34	.90	17	2	T	T	7.2	---	31	SE	12	7	8	15	6.3	44	460
illiamsport	527	993.9	1013.2	60	39	49.4	+.4	81	29	30	21	0	6	35	61	2.25	-1.22	.81	12	2	T	T	10.4	W	59	ESE	12	7	5	18	7.0	-	467
RHODE ISLAND																																	
ock Island	110	1008.8	------	55	41	48.0	+1.0	[illegible]	26	36	21	0	[illegible]	-		2.27	-1.26	1.23	9	2	[illegible]	[illegible]	----	---	--	---	--	6	12	12	6.0	--	505
rovidence CO	12	--- --	-- -	62	42	51.9	+5.3	71	26	37	18	0	0	-	--	3.95	+.72	1.96	10	2	.0	0	----	---	--	--	--	--	---	-	-	—	386
rovidence	55	1006.8	1012.9	[illegible]	41	[illegible]	+6.0	[illegible]	29	34	*5	0	[illegible]	37	67	3.57	[illegible]	1.95	[illegible]	1	T	0	10.1	SW	37	SW	15	6	13	11	6.1	67	[illegible]

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point		Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy			
												Max. 90° F. or above	Min 32° F or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date						
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1013.5	----	72	58	64.6	+0.1	82	27	45	3	0	0	--	-	1.81	-0.72	0.74	5	3	.0	0	10.4	---	29	W	3	15	7	8	4.6	71	58
Charleston	41	1013.9	1015.9	74	51	62.5	+.4	86	30	37	[illegible]	0	0	53	73	1.92	-1.21	.94	[illegible]	2	.0	0	9.2	SW	--	---	--	12	9	9	5.0	—	105
Columbia CO	332	1002.0	----	73	52	62.3	-1.0	89	30	40	4	0	0	--	--	3.91	+1.02	1.58	9	1	.0	0	9.0	---	34	W	13	15	4	11	4.7	74	124
Columbia	217	1006.4	1014.7	74	50	61.9	----	89	30	35	•5	0	0	47	64	4.87	----	1.76	9	2	T	T	8.3	WSW	--	---	--	13	8	9	4.6	—	133
Florence	146	1009.5	1014.9	75	49	61.9	----	89	30	39	18	0	0	48	65	3.40	----	1.43	8	2	.0	0	8.5	SW	--	---	--	13	10	7	4.9	—	123
Greenville	1006	977.0	1014.1	69	49	59.0	+.4	85	30	34	4	0	0	44	62	3.70	-.02	1.25	9	1	.0	0	8.9	SSW	40	SW	9	13	6	11	5.1	75	205
Spartanburg	801	984.8	1014.9	71	49	59.9	+.7	86	30	35	4	0	0	45	62	4.74	+1.24	2.42	9	1	.0	0	9.8	SW	--	---	--	13	7	10	4.8	—	183
SOUTH DAKOTA																																	
Huron	1282	966.5	1014.2	52	33	42.2	-2.9	85	28	22	16	0	20	31	70	1.26	-.98	.77	13	1	1.0	5	14.6	NNW	68	SE	30	5	5	20	7.3	59	681
Rapid City	3215	899.4	1015.3	54	27	40.6	-3.5	85	29	13	22	0	22	22	54	.51	-.92	.15	7	3	1.2	T	15.0	NNW	50	NW	14	5	9	16	6.6	68	725
Sioux Falls	1420	962.4	1014.7	51	34	42.3	-4.8	80	28	23	16	0	17	34	75	2.33	-.18	.72	11	3	.9	3	14.5	NNW	°40	WNW	14	6	4	20	7.5	—	676
TENNESSEE																																	
Bristol	1519	960.0	1014.5	65	42	53.7	-3.7	85	30	29	18	0	3	41	66	3.79	+.32	1.06	12	0	T	0	8.5	WSW	--	---	--	6	8	16	7.2	—	353
Chattanooga	670	987.1	1014.7	70	47	58.2	+.6	88	30	33	4	0	0	45	67	5.50	+.65	1.56	13	8	.0	0	7.5	SSW	41	SW	11	9	7	14	6.2	54	236
Knoxville	949	979.3	1014.7	68	46	56.8	-.5	87	30	33	18	0	0	44	67	5.33	+1.19	1.80	17	7	T	0	11.1	SW	38	W	11	4	11	15	7.0	38	277
Memphis CO	---	----	----	--	--	----	---	-	--	-	--	-	-	-	--	----	----	----	--	--	----	---	----	---	--	---	--	--	--	--	---	—	228
Memphis	263	999.3	1013.9	68	48	58.3	-3.5	85	28	33	10	0	0	46	67	2.78	-2.22	.88	10	7	.0	0	12.1	S	32	SE	6	6	7	17	6.9	57	245
Nashville	577	994.6	1014.2	66	45	55.6	-3.4	87	30	32	2	0	1	46	72	4.75	+.62	1.59	12	5	1.0	T	8.6	S	34	W	21	5	11	14	6.6	43	325
TEXAS																																	
Abilene	1752	950.6	1010.8	78	50	63.8	+.8	92	24	35	2	4	0	37	48	1.56	-1.15	.65	6	4	T	T	15.7	SSE	61	S	30	13	14	3	3.9	74	134
Amarillo	3590	885.5	1010.5	68	39	53.7	-.1	91	24	26	11	1	6	31	49	.43	-1.40	.22	3	5	T	T	15.4	N	56	SW	•24	12	9	9	4.4	67	349
Austin	515	991.5	1012.6	80	55	67.4	-.4	98	19	38	12	1	0	51	62	1.04	-3.30	.35	6	5	.0	0	11.3	SSE	35	SE	21	11	8	11	4.9	63	62
Big Spring	2533	923.5	1011.2	77	48	62.7	-1.3	91	14	31	12	2	1	35	44	.39	-1.33	.23	3	6	T	0	14.6	S	--	---	--	12	14	4	4.1	—	141
Brownsville	16	1009.1	1011.3	82	65	73.3	-.4	90	19	52	13	1	0	64	79	.31	-1.42	.15	5	3	.0	0	14.4	SE	36	NW	11	5	10	15	6.7	37	7
Corpus Christi	40	1012.2	1012.6	80	62	71.3	+2.3	90	21	45	12	1	0	60	78	.63	-1.15	.49	7	1	.0	0	14.6	SSE	43	N	11	6	13	11	6.3	79	15
Dallas	487	993.9	1012.1	77	52	64.3	-.8	90	14	37	12	1	0	46	57	1.26	-3.00	.55	6	5	.0	0	13.7	SSE	38	SE	30	12	12	6	4.5	69	115
Del Rio CO	957	975.3	1010.0	86	58	72.0	+1.4	102	30	39	12	10	0	43	45	.33	-1.46	.33	1	3	.0	0	10.2	---	44	NW	30	14	8	8	4.5	79	22
El Paso	3920	882.2	1008.6	75	48	61.3	-1.0	86	24	34	12	0	0	27	31	.45	+.19	.29	1	2	T	T	13.1	WSW	52	NW	29	12	12	6	4.0	80	131
Fort Worth	688	988.5	1012.4	78	51	64.7	+.6	94	18	38	12	2	0	41	52	2.27	-1.75	.72	7	4	.0	0	17.2	SSE	42	NW	12	12	14	4	4.2	—	112
Galveston CO	7	----	----	71	62	66.4	-2.3	83	22	48	11	0	0	--	--	.63	-2.43	.48	5	0	.0	0	13.5	---	34	N	2	--	--	--	---	53	35
Galveston	7	1013.5	1015.9	72	61	66.6	-2.1	82	22	47	12	0	0	59	81	.72	-2.34	.50	6	2	.0	0	14.6	SE	--	---	--	10	9	11	5.7	—	36
Houston CO	41	1008.8	---	77	59	68.0	-1.3	87	21	46	12	0	0	--	--	.69	-2.89	.36	5	3	.0	0	12.7	---	43	SE	30	11	7	12	5.3	76	42
Houston	41	1011.5	1014.0	77	57	67.0	-.8	87	19	38	12	0	0	56	75	1.28	-1.94	.60	8	2	T	T	14.7	SSE	--	---	--	9	10	11	5.7	—	59
Laredo	500	995.9	1010.5	8[illegible]	64	76.4	+1.2	106	30	49	12	18	0	55	56	.27	-.93	.22	2	2	T	0	14.8	SE	--	---	--	13	8	9	5.0	—	
Lubbock	3238	899.4	1010.1	72	42	57.2	-2.5	91	24	27	11	1	6	33	49	.58	-.84	.33	4	5	T	0	17.3	N	°56	N	10	16	7	7	4.2	—	26
Palestine CO	491	961.4	1013.5	75	55	64.7	-1.3	89	19	40	12	0	0	--	--	2.25	-2.16	1.26	9	5	T	0	10.1	---	28	NW	•11	14	5	11	4.7	71	10
Port Arthur CO	5	1012.9	----	74	60	66.8	-1.7	84	22	44	12	0	0	--	--	.54	-2.45	.23	8	2	.0	0	14.0	---	43	SE	30	10	7	13	5.6	63	4
Port Arthur	5	1013.2	1013.7	76	56	65.8	-- -	84	22	39	12	0	0	57	81	1.15	----	.53	7	3	.0	0	12.2	SSE	--	---	--	9	7	14	5.9	—	6
San Angelo	1903	945.1	1010.5	79	50	64.6	-.5	91	14	31	12	3	1	39	46	.55	-1.44	.40	[illegible]	4	.0	0	14.1	SSE	°60	WNW	30	14	10	6	4.3	—	10
San Antonio	782	988.8	1012.0	82	56	68.9	-.2	99	19	36	12	3	0	49	58	.93	-2.26	.29	8	5	T	0	11.2	SE	38	NE	9	12	7	11	4.6	63	5
Victoria	109	1008.5	1012.7	81	60	70.4	-.2	91	21	43	12	2	0	57	72	.50	-2.28	.24	6	3	.0	0	10.7	SSE	°46	WNW	6	8	10	12	6.0	—	2
Waco	504	993.2	1011.2	79	53	66.1	-1.0	93	19	36	12	1	0	47	57	2.76	-1.48	1.48	7	6	.0	0	13.3	S	--	---	--	12	9	9	4.7	—	7
Wichita Falls	1027	975.3	1011.4	76	47	61.3	-3.6	94	18	32	2	3	2	40	52	3.02	+.38	1.64	5	3	T	T	15.0	SE	°47	N	10	16	10	4	3.9	—	18
UTAH																																	
Milford	5029	842.9	1012.1	63	33	48.3	+.4	75	14	21	11	0	15	28	51	1.63	+.79	.85	7	6	.1	T	8.9	SSW	--	---	--	6	8	16	6.5	—	49
Salt Lake City	4222	866.9	1010.5	62	38	50.3	+2.4	74	13	23	11	0	7	32	53	2.60	+.89	1.07	12	5	1.7	2	8.0	SSE	37	SW	23	12	2	16	5.4	68	43
Salt Lake City CO	4260	----	----	--	--	----	----	--	--	--	--	--	--	--	--	----	----	----	--	--	----	---	----	--	--	---	--	--	--	--	---	--	38
VERMONT																																	
Burlington	398	997.0	1011.8	53	37	44.8	+1.5	67	29	27	6	0	4	37	76	3.55	+1.40	1.05	15	0	3.0	2	10.0	S	35	S	19	1	9	20	8.1	29	59
VIRGINIA																																	
Cape Henry	16	1013.5	1014.2	65	49	56.7	+2.1	89	26	40	21	0	0	--	--	2.02	-1.28	.55	11	5	.0	0	----	---	45	NW	26	10	14	6	5.0	74	2
Lynchburg	947	980.7	1014.2	66	44	55.3	-.3	85	26	31	18	0	1	40	60	4.66	+1.71	1.39	14	4	.0	0	10.7	S	30	SW	15	6	10	14	6.2	55	3
Norfolk CO	11	1011.5	----	69	49	58.8	+2.0	88	26	41	3	0	0	--	--	2.29	-.94	.83	12	5	.0	0	10.5	---	35	W	15	--	--	--	---	74	2
Norfolk	25	1013.9	1014.9	68	47	57.1	+3.0	88	26	37	21	0	0	44	64	2.28	-.95	.72	11	[illegible]	.0	0	11.7	SW	--	---	--	10	10	10	5.5	—	2
Richmond CO	162	----	----	69	45	56.9	+.3	88	29	33	18	0	0	--	--	2.55	-.94	.86	11	--	T	T	----	---	--	---	--	--	--	--	---	--	2
Richmond	160	1007.5	1014.4	69	44	56.6	+.8	89	29	29	18	0	1	42	62	2.26	----	.73	11	2	T	0	8.9	SSW	38	NW	26	6	11	13	6.4	67	2
Roanoke	1192	972.2	1014.1	66	43	54.5	-1.7	85	26	27	18	0	1	40	60	4.47	+1.57	1.09	11	[illegible]	.0	0	10.1	W	--	---	--	6	15	9	6.6	—	3
Washington CO	----	----	----	66	46	56.1	+2.8	87	29	36	18	0	0	--	--	3.93	+.66	1.27	11	3	.0	0	8.2	---	29	NW	29	--	--	--	---	57	2
Wash. Nat'l. AP	14	1009 8	1014.0	66	46	55.9	+2.6	86	29	35	18	0	0	40	58	3.49	+.22	1.26	12	3	.0	0	10.2	S	40	NW	29	5	7	18	6.8	48	2
WASHINGTON																																	
Ellensburg	1727	953.6	1016.2	64	32	48.1	-.1	78	16	18	21	0	18	29	50	.11	-.36	.09	2	0	T	T	12.6	WNW	--	---	--	16	9	5	3.5	—	5
Kelso	17	-	-	66	36	51.2	----	80	11	27	21	0	7	--	--	.79	----	.67	3	0	T	0	----	---	--	---	--	13	6	11	5.3	—	4
North Head CO	194	[illegible]	1016.9	54	43	48.5	+1.0	80	11	39	1	0	0	--	--	1.23	-2.91	.91	4	0	.0	0	13.3	---	57	S	27	5	10	15	6.5	53	4
Olympia	190	1009.5	1016.8	65	34	49.4	----	82	12	24	21	0	14	36	65	.54	----	.45	4	0	T	T	3.9	NNW	--	---	--	13	8	9	4.9	—	4
Port Angeles	11	1016.9	1018.0	56	41	48.6	----	65	16	36	20	0	0	38	69	.14	----	.14	1	0	.0	0	9.6	W	--	---	--	16	7	7	4.1	—	4
Seattle	14	1016.3	1017.3	--	--	----	----	--	--	-	--	--	-	37	61	----	----	----	--	-	----	---	7.8	NNW	--	---	--	--	--	--	---	--	-
Seattle CO	14	--	- -	63	44	53.5	+2.4	81	12	38	1	0	0	--	--	.52	-1.86	.50	3	0	.0	0	8.1	---	25	SW	18	15	8	7	4.1	76	3
Spokane	2357	946.2	1015.4	61	36	48.3	-.1	74	12	21	19	0	6	29	49	.38	-.75	.32	3	0	.0	0	7.5	SW	26	SW	7	17	6	7	3.9	75	4
Stampede Pass CO	3960	878.1	1018.1	47	32	39.5	----	63	12	16	19	0	16	--	--	1.12	----	.63	6	0	1.8	111	12.8	---	31	E	19	15	8	7	4.0	—	7
Stevenson CO	319	--	----	63	42	52.7	----	79	12	32	21	0	1	-	--	1.51	----	1.28	4	0	T	T	----	---	--	---	--	15	6	9	4.4	—	3
Tacoma CO	127	1009.8	1016.9	61	42	51.2	+2.5	80	12	36	21	0	0	--	--	.44	-2.34	.43	3	0	T	0	7.7	---	24	N	•11	15	10	5	3.5	70	4
Tatoosh CO	101	1014.2	1017.5	53	43	47.9	+1.8	68	14	39	1	0	0	40	77	.88	-4.7[illegible]	.74	5	0	.0	0	12.4	E	46	E	19	8	11	11	5.6	63	5
Walla Walla	1200	----	----	--	--	----	----	--	--	--	--	--	--	32	--	----	----	----	--	--	----	---	7.0	E	--	---	--	--	--	--	---	--	-
Walla Walla CO	949	979.0	1014.9	66	42	54.4	+1.3	79	13	30	21	0	1	--	--	.88	-.63	.62	4	0	.0	0	5.4	---	20	SW	18	17	7	6	3.6	84	3
Yakima	1061	976.3	1015.4	69	33	50.7	-1.1	84	13	21	21	0	16	27	44	.14	-.41	.10	2	0	.0	0	7.1	W	--	---	--	18	6	6	3.4	—	4
Seattle-TacomaAP	379	1002.7	1017.1	61	38	49.6	----	77	12	29	21	0	1	36	62	.65	----	.61	3	0	T	T	10.1	N	--	---	--	12	9	9	4.6	—	4
WEST VIRGINIA																																	
Charleston	950	978.0	1013.8	65	43	53.9	----	85	25	29	18	0	2	40	64	2.97	----	.62	16	3	T	0	10.0	SW	45	NW	26	5	4	21	7.6	—	3
Elkins	1969	944.5	1014.1	60	37	48.3	+.9	80	25	21	18	0	8	38	71	4.36	+.74	.78	19	3	1.4	T	6.9	WNW	39	W	13	3	6	21	8.0	39	5
Huntington	565	----	----	68	45	56.2	+3.8	88	30	32	18	0	1	--	-	3.12	-.58	.57	17	--	T	0	----	---	--	---	--	--	--	--	---	—	3
Parkersburg CO	615	----	----	63	41	52.1	-1.3	86	28	28	18	0	2	--	--	2.94	-.26	.53	14	[illegible]	T	T	6.7	---	29	NW	29	3	6	21	8.1	47	4
Parkersburg	837	----	1013.4	--	--	----	----	--	--	--	--	--	--	39	--	----	----	----	--	--	----	---	9.4	SW	--	---	--	--	--	--	---	--	-
Petersburg	1013	976.3	----	65	41	52.9	----	85	25	25	18	0	6	--	--	2.67	----	.58	12	[illegible]	T	0	----	---	--	---	--	5	5	20	7.3	—	
WISCONSIN																																	
Green Bay	689	985.4	1011.6	50	34	41.8	-1.4	80	28	26	20	0	16	34	76	4.79	+2.14	1.13	15	0	1.2	1	12.5	NW	56	W	22	2	6	22	8.3	33	
La Crosse CO	----	----	----	--	--	----	----	--	--	--	--	--	--	--	--	----	----	----	--	--	----	---	----	---	--	---	--	--	--	--	---	--	
La Crosse	669	986.8	1011.8	51	35	42.8	-2.8	81	28	23	5	0	12	34	76	5.12	+2.70	1.35	16	3	.9	1	10.5	NW	32	NW	13	4	5	21	7.9	--	
Madison CO	----	----	----	-	-	----	----	-	-	-	-	--	--	--	--	----	----	----	--	--	----	---	----	---	--	---	--	--	--	--	---	--	
Madison	857	979.7	1011.7	53	35	43.9	-1.5	80	28	26	17	0	12	36	78	4.42	+1.65	1.32	16	4	1.2	1	12.9	W	34	NE	12	3	5	22	7.9	35	
Milwaukee CO	--	----	----	--	-	--	----	--	--	-	-	--	--	--	--	----	----	----	--	--	----	---	----	---	--	---	--	--	--	--	---	--	
Milwaukee	674	985.8	1011.5	50	36	42.9	+.7	82	28	29	16	0	9	35	79	4.91	+2.23	1.41	19	3	1.8	1	11.4	WNW	31	E	11	2	8	20	8.0	33	

See footnotes at end of table.

CLIMATOLOGICAL DATA

able 2—Continued

APRIL 1951

State and station	Elevation (ground) Ft	Pressure: Station Mb.	Pressure: Sea level Mb.	Temperature: Average maximum °F.	Temperature: Average minimum °F	Temperature: Average °F.	Temperature: Departure from normal °F.	Temperature: Highest °F	Temperature: Date	Temperature: Lowest °F.	Temperature: Date	No. of days: Max. 90° F or above	No. of days: Min. 32° F or below	Average dew point °F.	Average relative humidity %	Precipitation: Total In.	Precipitation: Departure from normal In.	Precipitation: Greatest in 24 hours In.	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total In.	Snow, Sleet, Hail: Max. depth on ground In.	Wind: Average hourly speed M. p. h.	Wind: Prevailing direction	Fastest mile: Speed M. p. h.	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear 0–3	Partly cloudy 4–7	Cloudy 8–10	Sky cover, tenths (sunrise to sunset) 0–10	Possible sunshine %	Heating degree days
WYOMING																																	
asper	5322	833.7	1013.1	50	25	37.9	-5.9	69	13	14	22	0	24	22	60	1.31	-0.75	0.48	11	3	9.1	4	9.7	SW	--	-		5	11	14	6.9	—	805
heyenne	6139	807.3	1013.3	49	26	37.3	-3.6	67	28	12	11	0	23	24	64	1.94	-.05	.53	11	7	5.3	3	15.4	NNW	35	W	27	4	9	17	7.4	52	822
ander	5563	832.0	1013.4	54	[illegible]	40.7	-1.7	73	13	15	22	0	23	20	55	1.67	-.39	.68	10	1	9.7	5	7.4	--	34	NW	9	8	11	11	6.0	64	722
ock Springs	6741	789.7	1012.6	52	27	39.1	-2.3	66	13	14	11	0	23	22	56	.77	-.41	.24	10	3	3.2	1	14.4	W	*44	W	9	7	12	11	6.1		769
heridan	3942	882.2	1015.2	54	27	40.5	-2.8	77	28	12	22	0	25	24	58	1.41	-.51	.42	11	3	7.3	1	10.4	NW	42	SE	*24	6	12	12	6.6	62	726
PACIFIC AREA																																	
anton Island	12	1008.8	1009.1	91	78	84.7	-----	97	22	74	24	24	0	76	81	5.55	-----	2.67	16	2	.0	0	---	---	-	---	---	4	20	6	5.9	—	0
ilo	28	1015.9	1017.2	79	64	71.5	-----	83	30	61	[illegible]	0	0	64	78	4.38	-----	.67	25	0	.0	0	5.3	SW	21	ENE	23	0	9	21	7.8		0
onolulu CO	12	------	------	79	69	73.6	+.6	80	5	65	13	0	0	-	-	.49	-1.62	.11	15	-	.0	0	---	--		-							0
onolulu	7	1017.3	1017.9	81	68	74.4	-----	83	18	62	13	0	0	63	69	.49	----	.26	10	0	.0	0	11.1	ENE	30	NE	2	11	16	3	4.4	[illegible]	0
ihue	115	1012.5	1017.7	79	67	73.0	-----	82	30	61	13	0	0	64	75	3.28	-----	1.10	17	0	.0	0	9.6	NE	28	NE	2	3	19	8	6.1		0
ake Island	11	1016.6	1017.1	82	74	78.2	-----	85	26	69	17	0	0	69	76	1.19	----	.30	12	0	.0	0	12.4	E	--	---	-	16	11	3	4.1	—	0
WEST INDIES																																	
an Juan, P.R. CO	-----	-----	------	83	72	77.6	+1.0	92	9	70	3	4	0	--	--	3.95	-.41	2.80	6	2	.0	0	-	-		-	-	-	-	-			0
an Juan, P.R.	9	1013.2	1020.1	84	72	77.7	----	89	9	69	3	0	0	70	79	4.35	----	2.76	8	1	.0	0	---		21	S	10	10	13	7	5.1	59	0
ALASKA																																	
nchorage	134	1004.7	1009.8	45	30	37.3	+1.9	57	19	19	3	0	24	28	70	.53	+.12	.22	[illegible]	0	T	10	5.2	NW	20	NE	5	3	3	24	[illegible]	30	825
nnette Island	110	1014.0	1017.9	[illegible]	36	42.0	-.5	58	15	30	7	0	5	34	74	6.97	-1.29	1.35	15	0	T	0	11.0	[illegible]				7	3	20	7.1	—	680
arrow	22	1019.3	1019.6	9	-2	3.4	+3.8	35	17	-16	5	0	30	68	72	.22	+.10	.16	4	0	1.6	12	16.3		[illegible]	ESE	16	7	4	19	6.9	—	1850
ethel	21	1003.7	1005.1	37	23	29.7	+2.9	57	20	2	9	0	27	25	82	1.04	+.49	.38	13	0	6.1	34	9.2			SSE	16	4	3	23	8.0		1053
ordova	40	1010.2	1011.9	42	29	35.4	+.3	49	20	17	12	0	23	32	87	7.72	+4.12	1.42	20	0	8.3	27	4.5						[illegible]	[illegible]	8.4		883
airbanks	436	992.2	1009.5	47	22	34.4	+2.7	61	27	4	13	0	26	24	66	.04	-.26	.02	2	0	.3	27	5.6				[illegible]	[illegible]	9	17	[illegible]		910
alena	120	1004.1	1008.8	39	21	30.0	+8.7	51	20	10	5	0	27	22	69	.08	-.15	.06	3	0	.1	17	[illegible]		39	SSE	[illegible]		[illegible]		7.0		1046
ambell	26	1008.9	1010.0	21	13	16.9	-1.4	37	18	-1	8	0	30	12	80	2.19	+1.08	.79	17	0	19.6	13	19.9		[illegible]						8.7		[illegible]
uneau	15	1014.9	1015.9	46	32	39.0	-1.2	57	20	24	19	0	14	32	77	3.51	+.47	.67	18	0	T	T	9.3	[illegible]		SE					8.1	31	773
otzebue	10	1010.8	1011.5	27	[illegible]	20.8	+7.2	37	16	-2	26	0	29	17	80	.43	+.08	.13	13	0	2.5	18	15.2								[illegible]		[illegible]
cGrath	334	994.9	1007.8	43	24	33.1	+7.9	52	19	8	4	0	25	25	70	1.13	+.71	.55	10	0	9.2	20	4.5		38	SSE	[illegible]			[illegible]	7.4		950
ome	13	1007.8	1008.5	31	21	25.7	+6.0	45	20	7	26	0	28	22	83	.71	+.04	.23	12	0	6.3	21	12.8	N	36	[illegible]	[illegible]						1171
orthway	1713	946.8	1010.8	44	20	32.2	+7.3	[illegible]	27	3	4	0	27	26	64	.60	+.24	.49	30	0	.7	9	3.4	SE		-	-	1		[illegible]			[illegible]
t. Paul Island	22	1001.2	1002.4	31	24	27.8	-1.2	40	17	[illegible]	10	0	25	25	86	1.29	.00	.17	18	0	5.8	6	--						3	27	[illegible]		[illegible]
miat	337	1006.4	1020.3	1	-6	-2.4	-1.7	40	6	-28	2	0	30	-1	79	.16	-.18	.04	7	0	1.4	10	9.2	E		-		[illegible]	[illegible]	[illegible]	7.5	--	[illegible]
ales	9	1010.8	1011.5	19	8	13.4	+2.0	43	16	-4	2	0	30	9	77	.32	-.01	.27	[illegible]	0	.9	23	--	---				[illegible]	0	[illegible]			[illegible]
akutat	28	1013.2	1014.4	42	31	36.2	-1.0	54	20	23	14	0	24	34	91	9.15	+1.37	1.94	19	0	1.8	18	7.5	E	40	ESE	5	1	6	[illegible]	8.8	--	858

ata from airport unless otherwise specified. CO indicates data from city office.
Other dates also.
Date entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
Peak gust.

HEATING DEGREE DAYS

(Base 65°F.)

Table 3

APRIL 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	186	2867	2587
Mobile (CO)	81	1689	1563
Mobile	95	1775	
Montgomery (CO)	111	2171	2061
Montgomery	121	2331	2061
ARIZONA			
Flagstaff	682	6136	6582
Payson (CO)	374	3289	
Phoenix (CO)	35	1004	1434
Phoenix	36	1129	
Prescott	388	3727	
Tucson	81	1394	
Winslow	342	3971	
Yuma	9	638	1035
ARKANSAS			
Ft. Smith	240	3457	3189
Little Rock	216	3168	2977
Texarkana	155	2630	
CALIFORNIA			
Bakersfield	91	1730	
Beaumont (CO)	289	2280	
Bishop	253	3463	
Blue Canyon	488	4715	
Burbank			
Eureka (CO)	474	3762	4060
Fresno	146	2198	2347
Los Angeles (CO)	134	1055	1261
Los Angeles	194	1502	
Mt. Shasta (CO)	415	4968	
Oakland	312	2383	
Red Bluff	131	2425	2572
Sacramento (CO)	191	2227	2358
Sacramento	211	2373	
Sandberg (CO)	433	3464	
San Diego	123	1143	1429
San Francisco (CO)	373	2599	2685
San Francisco	378	2605	
San Jose	242	2030	
Santa Catalina	341	1880	
Santa Maria	300	2287	
COLORADO			
Alamosa	739	7534	
Colorado Springs	693	5985	
Denver	628	5571	5500
Grand Junction	391	5110	
Pueblo	525	5287	5334
CONNECTICUT			
Bridgeport	430	5004	
Hartford	441	5328	5853
New Haven	451	5134	5612
DELAWARE			
Wilmington	396	4846	
DIST. OF COLUMBIA			
Washington (CO)	281	4011	4446
Washington	283	4032	
FLORIDA			
Apalachicola	66	1442	1250
Daytona Beach	49	1083	
Fort Myers	6	491	
Jacksonville (CO)	31	1261	1182
Jacksonville	45	1380	
Key West (CO)	0	85	59
Key West	0	104	
Melbourne	22	699	
Miami (CO)	5	299	185
Miami Beach	0	168	
Int. Airport, Hialeah	2	254	
Orlando	25	796	
Pensacola (CO)	87	1530	1277
Tallahassee	73	1616	
Tampa	19	673	571
West Palm Beach	6	317	
GEORGIA			
Albany	91	1961	1647
Atlanta (CO)	200	3096	2950
Atlanta	190	2968	
Athens	201	3092	
Augusta	133	2625	2292
Columbus	155	2546	
Macon	103	2319	2323
Rome	236	5388	
Savannah	76	2045	1629
Valdosta	80	1781	
IDAHO			
Boise	422	5140	5334
Lewiston	386	4800	
Pocatello	535	6110	6287
ILLINOIS			
Cairo (CO)	311	4080	3893
Chicago (CO)	553	6016	5956
Chicago	547	6421	
Chicago University	574	6224	
Joliet	551	6703	
Moline	543	6709	
Peoria	528	6308	5798
Springfield (CO)	464	5601	5298
Springfield	509	5949	
INDIANA			
Evansville	401	4900	4319
Ft. Wayne	550	6273	5974
Indianapolis (CO)	475	5482	5282
Indianapolis	512	5836	
South Bend	582	6437	
Terre Haute	491	5714	

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
IOWA			
Burlington	529	6533	
Charles City (CO)			7307
Davenport (CO)	535	6487	6052
Des Moines	587	6809	6342
Dubuque	639	7212	6575
Keokuk (CO)	563	6180	5509
Sioux City	630	7134	6663
KANSAS			
Concordia (CO)	485	5412	5265
Dodge City	459	4996	4910
Goodland	601	5818	
Topeka (CO)	452	5077	4946
Topeka	462	5295	
Wichita	408	4693	4532
KENTUCKY			
Lexington	425	4965	4655
Louisville (CO)	374	4559	4316
Louisville	389	4710	
Pikeville (CO)	303	3881	
LOUISIANA			
Baton Rouge	91	1690	1505
Lake Charles	77	1554	
New Orleans (CO)	49	1226	1202
New Orleans	69	1391	
Int. Airport, Moisant	68	1431	
Shreveport	126	2254	2122
MAINE			
Caribou	709	8427	
Eastport	639	6606	7614
Greenville (CO)	748	8171	8777
Portland	574	6477	6865
MARYLAND			
Baltimore (CO)	295	4060	4380
Baltimore	338	4494	
Frederick	390	4745	
MASSACHUSETTS			
Boston	416	4858	5625
Milton	533	5785	
Nantucket	532	4940	5388
Pittsfield	598	6764	
MICHIGAN			
Alpena (CO)	720	7436	7662
Detroit	562	6108	6251
Escanaba (CO)	759	8167	8130
Grand Rapids (CO)	565	6207	6382
Grand Rapids	609	6626	
Lansing	612	6725	
Marquette (CO)	782	8186	8031
Muskegon	650	6709	
Sault Ste. Marie	732	8536	8605
Ypsilanti	573	6274	
MINNESOTA			
Duluth (CO)	798	9507	8974
Duluth	830	9880	
International Falls	874	10504	
Minneapolis	675	8328	7664
Rochester	724	8582	
St. Cloud	738	9210	8419
St. Paul	675	8307	
MISSISSIPPI			
Jackson	142	2297	2151
Meridian	152	2437	2312
Vicksburg	135	2205	2059
MISSOURI			
Columbia	458	5329	4936
Kansas City	439	5069	4842
St. Joseph	485	5607	
St. Louis (CO)	410	4918	4497
St. Louis	427	5080	
Springfield	429	4766	4448
MONTANA			
Billings	685	7181	6792
Butte	840	9142	
Glasgow (CO)	742	9396	
Great Falls	720	7632	
Havre (CO)	701	8530	7942
Helena	723	8036	7325
Kalispell	676	7470	7399
Missoula	633	7258	7056
NEBRASKA			
Grand Island	576	6313	
Lincoln (CO)	548	6056	5787
Lincoln	578	6353	
Norfolk	633	6927	
North Platte	623	6263	6108
Omaha	573	6443	5914
Valentine (CO)	691	7051	6836
NEVADA			
Elko	553	6104	
Ely	641	6397	
Las Vegas	84	2211	2612
Reno	452	5013	5227
Tonopah			5449
Winnemucca	471	5388	5922
NEW HAMPSHIRE			
Concord	574	6423	6992
Mt. Washington	1223	11641	
NEW JERSEY			
Atlantic City	404	4277	4770
Newark	369	4653	5309
Trenton	380	4669	5077

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
NEW MEXICO			
Albuquerque	301	3685	4421
Clayton	499	4782	
Roswell	226	3297	3526
Raton	620	5685	
NEW YORK			
Albany	514	6235	6382
Bear Mountain (CO)	512	5961	
Binghamton (CO)	507	6025	6477
Binghamton	554	6368	
Buffalo	592	6135	6487
New York (CO)	378	4470	5078
La Guardia Field	339	4360	
Oswego	600	6197	
Rochester	573	6213	6419
Schenectady (CO)	506	6093	
Syracuse	547	6289	6540
NORTH CAROLINA			
Asheville (CO)	332	4116	4107
Asheville	360	4402	
Charlotte (CO)	168	311	3181
Charlotte	179	3262	
Greensboro	270	3891	
Hatteras (CO)	145	2520	2519
Raleigh (CO)	179	3173	3223
Raleigh	222	3440	
Wilmington (CO)	108	2407	2395
Winston-Salem	252	3725	
NORTH DAKOTA			
Bismarck	738	9603	8488
Devils Lake (CO)	797	10267	9548
Fargo	735	9575	
Grand Forks	768	9862	9389
Williston (CO)	765	9591	8803
OHIO			
Akron	582	6287	
Cincinnati (CO)	381	4690	4844
Cincinnati	455	5323	
Cleveland (CO)	536	5641	5836
Cleveland	540	5826	
Columbus (CO)	464	5346	5316
Columbus	485	5654	
Dayton	515	5854	5226
Sandusky (CO)	545	5700	5821
Toledo	563	6202	5995
Youngstown	579	6245	
OKLAHOMA			
Oklahoma City (CO)	255	3502	3609
Oklahoma City	269	3634	
Tulsa	275	3707	
OREGON			
Baker (CO)	544	6149	6562
Baker	573	6484	
Burns (CO)	485	6128	
Eugene	342	3952	
Meacham	645	6763	
Medford	238	3926	4353
Pendleton	379	4827	
Portland (CO)	259	3736	4008
Portland	337	4093	
Roseburg (CO)	282	3453	3964
Salem	366	4125	
Sexton Summit (CO)	433	5355	
Troutdale	306	4155	
PENNSYLVANIA			
Allentown	451	5437	
Curwensville	642	6976	
Erie (CO)	558	5666	6011
Harrisburg	400	5107	5243
Park Place	587	6432	
Philadelphia (CO)	328	4281	4607
Philadelphia	342	4462	
Pittsburgh (CO)	441	4993	5159
Pittsburgh	484	5442	5459
Reading (CO)	362	4730	5065
Scranton (CO)	460	5535	5954
Williamsport	467	5755	5836
RHODE ISLAND			
Block Island	505	4778	5435
Providence (CO)	386	4745	5687
Providence	438	5087	
SOUTH CAROLINA			
Charleston (CO)	58	2031	1859
Charleston	105	2284	
Columbia (CO)	124	2538	2469
Columbia	133	2737	
Florence	133	2670	
Greenville	205	3264	3018
Spartanburg	183	3256	
SOUTH DAKOTA			
Huron	681	8146	7599
Pierre	667	7458	6993
Rapid City	725	7129	6749
Sioux Falls	675	7904	
TENNESSEE			
Bristol	353	4313	
Chattanooga	236	3377	3198
Knoxville	277	3696	3599
Memphis	245	3351	3056
Nashville	325	3927	3555
TEXAS			
Abilene	134	2484	2549
Amarillo	349	3975	4078
Austin	62	1598	1678
Big Spring	141	2520	
Brownsville	7	625	621

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
TEXAS (Cont'd.)			
Corpus Christi	15	904	964
Dallas	115	2293	2352
Del Rio (CO)	22	1391	1498
El Paso	131	2346	2517
Ft. Worth	112	2323	2338
Galveston (CO)	35	1115	1173
Galveston	36	1151	
Houston (CO)	42	1206	
Houston	59	1363	1313
Laredo	3	839	
Lubbock	267	3508	
Palestine (CO)	100	1958	2057
Port Arthur (CO)	48	1296	1350
Port Arthur	69	1511	
San Angelo	101	2222	
San Antonio	51	1562	1431
Victoria	27	1104	
Waco	79	1995	
Wichita Falls	184	2977	.
UTAH			
Milford	500	5581	
Salt Lake City (CO)	380	4822	5356
Salt Lake City	435	5155	5761
VERMONT			
Burlington	599	6864	7606
VIRGINIA			
Cape Henry	265	3333	3446
Lynchburg	305	4230	3975
Norfolk (CO)	206	3099	3297
Norfolk	253	3393	
Richmond (CO)	258	3692	3842
Richmond	267	3847	
Roanoke	327	4268	
Urbanna			
WASHINGTON			
Ellensburg	492	6374	
Kelso	407	4531	
North Head (CO)	487	4668	4627
Olympia	464	4891	
Port Angeles	482	5178	
Seattle (CO)	337	3985	4356
Seattle	458	4859	
Spokane	496	6084	5915
Stampede Pass (CO)	759	8069	
Stevenson (CO)	364	4565	
Tacoma (CO)	408	4386	4555
Tatoosh Island (CO)	507	5166	5053
Walla Walla (CO)	314	4424	4668
Yakima	423	5592	5332
WEST VIRGINIA			
Elkins	504	5661	5513
Huntington	303	4076	
Parkersburg (CO)	404	4793	4781
Petersburg			
Charleston	366	4352	
WISCONSIN			
Green Bay	691	8313	7513
La Crosse (CO)	638	7582	7137
La Crosse	658	8062	
Madison (CO)	617	7439	7065
Madison	632	7648	
Milwaukee (CO)	659	6951	6636
Milwaukee	660	7217	
WYOMING			
Casper	805	7024	
Cheyenne	822	6870	6911
Lander	722	7090	7678
Rock Springs (CO)	682	6714	
Rock Springs	768	7365	
Sheridan	726	7201	
ALASKA			
Anchorage	825	10889	
Annette Island	680	6770	
Barrow			
Bethel	1053	11860	
Cordova	883	9549	
Fairbanks	910	14106	
Galena	1046	14187	
Gambell			
Juneau	773	8839	
Kotzebue			
McGrath	950	13575	
Nome			
Northway	977	15246	
St. Paul			
Yakutat	858	8726	
Umiat	1974	18036	
Wales			

Data from airport unless otherwise specified. CO indicates data from city office.

SEVERE STORMS

Table 4

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Lycoming, Tioga, and Huntingdon Counties, Pa.	Mar.30 Apr. 1						$57,165		Rains and flooding	Pennsylvania Department of Highways reported $47,665 damage to roads and $9,500 damage to bridges in the indicated area.
Kaufman, Kaufman County, Tex.	1	4 p.m.	†1	10					Hail	Occurred 8 miles southwest of Kaufman. Stones from size of marbles to hens' eggs. Ground covered about 1 inch deep.
Clarksville, Red River County, Tex.	1	5 p.m.	†2	20			40,000	$200	do	From 2 miles west of Clarksville to about 18 miles east. Principal damage to building roofs. Average size of stones 1/2 inch; largest, size of golf balls.
Owens Field, Columbia, S.C.	2	Afternoon					2,500		Thunderstorm and wind	Wind blew in walls of two small hangars each containing a small plane; roof collapsed damaging planes heavily.
Northwest of Norman to northeast of Moore, Cleveland County, Okla.	5	1:20-1:40 p.m.	125	6	0	0	20,000		Tornado	School damaged near Newcastle. Farm home near Moore damaged.
Blanchard (7 miles north and 2 miles west of), Grady County, Okla.	5	1:22-1:30 p.m.	100	‡350	0	2	80,000		do	Bridge Creek school damaged. Tornado moved eastward. Accompanied by moderate hail 1/4 inch in diameter.
Waynoka (4 miles southwest of), Woods County, Okla.	5	4:45 p.m.	33	3	0	2	5,000		do	Path northeastward. One building and one new truck destroyed. Accompanied by heavy hail, but no damage from hail.
Eufaula, McIntosh County, Okla.	5	6-6:30 p.m.					1,000		Hail	Principal hail loss to roofs of buildings in Eufaula.
Pope, Conway, Faulkner, Lonoke, and White Counties, Ark.	6	4-6:35 p.m.		75			250,500	100,000	Hail, wind, and rain	A series of hail- and windstorms occurred in a narrow belt from Russellville, Pope County to Lonoke, Lonoke County. Principal damage was near Conway in Faulkner County, where hail did extensive damage to roofs, windows, and automobiles, together with serious damage to strawberries and truck crops. Stones the size of golf balls reported to have fallen in Beebe over period of 32 minutes.
Florida, central portion	6-7		†50	150				Minor	Rain	Total rainfall for period 3 to 5 inches across central Florida from Tarpon Springs and Sarasota on West Coast to Fellsmere and Fort Pierce on East Coast.
New Orleans, La.	7	3 a.m.	850	1/2			50,000	Slight	Hail	Heavy hailstorm damaged several greenhouses, numerous automobiles, and much shrubbery, trees, etc. Final damage figures will be furnished later.
Hallettsville, Lavaca County, Tex.	9	5:25 p.m.	†9				Small	75,000	Hail and wind	In southern half of County, and adjoining counties to west of Dewitt and Gonzales.
Chautauqua County, Kans.	11	2 p.m.							do	Hail the size of peas fell for about 5 minutes with a strong wind of 40 m.p.h. in and near Sedan. Little damage. Storm moved southeastward.
Atchison County, Mo.	12	4 a.m. to 9 p.m.			1		2,500		Ice (glaze) and blowing snow	Driver of passenger car killed when his car collided with gravel truck on curve of Highway 275, about 1 1/2 miles east of Rockport. Both vehicles completely demolished. Accident apparently caused by blowing snow freezing on highway.
New England	15				2				Winds and thunderstorms	Windsqualls, accompanying thunderstorms, swept across southern New England and southern parts of northern New England caused numerous minor damages to trees, wires, signs, and small boats. Two persons drowned in Long Island Sound, near Norwalk, Conn.
awley, Pa.	15				2				Winds	Strong winds produced highest waves in memory of local residents on Lake Wallenpaupack. Two fishermen drowned when boat overturned.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Howard County, Ark.	18	Evening							Hail and wind	A hail- and windstorm in Howard County caused extensive damage to peach crop in Center Point area when trees were stripped of their leaves. Wind destroyed hangar, Taylorcraft plane, and crop duster near Nashville.
Kalispell, Mont.	18-19								Freeze	Freeze damage to all kinds of fruit trees, especially to cherry. Cherry crop on Flathead Lake expected to be of little commercial value this year.
St. Augustine, Fla.	19	4:30-6 p.m.					$3,000		Winds and thunderstorm	High winds with thunderstorm damaged several roofs
Fortine, Mont.	19								Freeze	Heavy freeze, following extended period of warm weather, was extremely damaging to fruit trees, berries, shrubs, flowers, and forest trees. Foli frozen on most of lodgepole pines in locality of station, and about one-half of Douglas firs and some yellow pine; needles turned brown or red by end of month. May result in appreciable reducti of Christmas tree crop.
Pawnee County, Kans.	20	7-7:30 a.m.							Hail	Light hail. Practically no damage. Storm moved northeastward across Larned.
Temple (near), Cotton County, Okla.	20	3 p.m.	†3	6			8,300	$20,000	Wind and hail	Damage by hail $20,000 to wheat in strip 2 miles wide and 6 miles long northeast of Temple. Damag by wind $8,300, included in total.
Wichita Falls, Tex.	20	3:10 p.m.	25	‡100	0	0	8,000		Tornado	Accompanied by light hail.
Morton County, Kans.	20	3:30 p.m.			0	0			Tornado and hail	A small tornado struck in open country 8 miles west of Rolla. Heavy hail fell at Rolla.
Duncan and Comanche, Stephens County, Okla.	20	4 p.m.	†2 to †6	15			21,000		Wind	Extensive damage to buildings, signs, trees, and automobiles.
Cement, Caddo County, Okla.	20	5 p.m.					15,000		Electrical	Oil tanks burned after being struck by lightning.
Stroud (7 miles north of), Lincoln County, Okla.	20						800		Electrical	Two head of cattle killed. Electric service disrupted.
Blytheville, Ark.	21	2 p.m.	200	14			20,000		Hail	Path of storm extended from 4 miles west of Blyth ville to 10 miles northeast. No damage to crops but estimated $20,000 damage to buildings and au- mobiles.
Jasper and Jones Counties, Miss.	21	7:25 p.m.	Narrow	30	2	13	50,000		Tornado	Struck hardest at Lebanon community, 7 miles west of Laurel in Jones County and passed over sparsely settled areas into central Jasper County; moved nor- northeastward.
Fort Morgan, Ala.	21	11:30p.m.				1	200		Electrical	Man struck by lightning while sitting at piano, rendered unconscious and knocked 8 feet. Three holes torn in roof, one large enough for a man t pass through. Musical instruments burned.
Montgomery (near), Ala.	21	P.m.					100		do	Man claims that he was knocked out of bed by ligh ning which also struck the plumbing, barbed wire fence, and an electric stove at his home in Dalida, a suburb of Montgomery.
LaSalle Parish, La.	21		Narrow	Short	0	2	15,000		Tornado	In rural area where little information available. Reported by American Red Cross.
Ouachita Parish, La.	21		Narrow	Short	0	1	8,000		do	In rural area halfway between Chatham and Monroe. Reported by American Red Cross.
Smith County, Miss.	21				0	0	18,000	Slight	do	Reported by American Red Cross.
McComb, Pike County, Miss.	21-29	4 p.m.				6	12,000		Wind	Injuries caused by flying glass when show window of department store blew out into street during windstorm. Signs blown down, and other windows broken.
Clinton (20 miles north of), Custer County, Okla.	24	5:30 p.m.			0	0			Tornado	Tornado struck in pasture; no damage.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Duke (near), Jackson County, Okla.	24	6:03 p.m.		2 1/2	0	0	$3,800		Tornado	Funnel hit ground and moved northeastward about 2 1/2 miles. One house unroofed; one barn damaged.
Oklahoma City, Okla.	24	9:30 p.m.					2,000		Wind	Damage to roofs, windows, awnings, and trees.
Perry (north of), Noble County, Okla.	24	Evening					1,000		do	Hay barn and machine shed blown down.
Blackwell (6 miles southwest of), Kay County, Okla.	24	Night			0	0	1,000		Tornado	Garage destroyed.
Arlington, Va.	26	4 p.m.			1	See remarks			Electrical	Man killed by lightning; two other persons stunned, but otherwise uninjured.
Richmond and vicinity, Va.	26	4:30 p.m.				2			Wind	Many large trees toppled. Power lines ripped. One house badly damaged by falling oak which also injured one person. Pilot injured at Byrd Field during emergency landing, the wind flipped his plane on top of him.
Grant County, Kans.	26	6:10 p.m.	†4-6	32	0	0	4,000		Tornado	Intermittent damage along a path from 12 miles southwest of Ulysses to 20 miles northeast. Tornado passed east of Ulysses. A few farm buildings damaged.
Morton County, Kans.	26	6:15 p.m.			0	0	2,000		do	A small tornado struck a moving AT&SF freight train 3 miles north of Rolla, derailing 2 cars.
Seward County, Kans.	26	7:15 p.m.			0	0	Small		do	Observer reported the cloud appeared like a large whirlwind. Only small intermittent damage 2 to 3 miles north of Liberal.
Beaver City (western portion), Beaver County, Okla.	26	7:15 p.m.	Narrow	Short	0	0	400		do	Path northeastward. Several farm buildings damaged.
Morton County, Kans.	26	Evening			0	0	Small		do	In and near Wilburton. Damaged several residences, grain bins, and garages. Three small funnel clouds observed.
Sweetwater (near), Beckham County, Okla.	26						500		Hail	Hailstones as large as turkeys' eggs damaged automobiles.
Ringwood (3 miles southeast of), Major County, Okla.	27	2:20 p.m.	200	‡1320	0	2	1,500		Tornado	One farmstead damaged.
Oskaloosa, Iowa	27	3:45 to 4 p.m.	5,000	14			100,000		Hail	Hailstones up to 2 inches in diameter damaged roofs and automobile tops and destroyed much greenhouse glass. One greenhouse alone estimated damage at $40,000.
Belle Plaine, Iowa	27	4:40 to 5 p.m.	3,000	4			2,000		do	Hailstones mostly up to 3/4 inch, but a few 1 1/2 inches. Damage mostly to composition roofs.
Chicago, Ill.	28	2:50 p.m.					12,000		Electrical and rain	A lightning-set fire resulted in $10,000 damage to a manufacturing plant. Underpasses and basements flooded by heavy rain.
Joliet-Lockport area, Ill.	28	Late afternoon					50,000		Thunderstorm (possible tornado)	Reported as a tornado by some observers. Farm buildings destroyed at Stateville prison farm near Joliet. An airplane damaged at Lewis School of Aeronautics, Lockport. Considerable damage to wires and television antennae in Joliet.
Gary, Ind.	28	5 p.m.					10,000		Wind	Plate glass windows blown in, telephone lines downed, chimneys and television antennae damaged. Damage to television antennae alone may have been much greater than estimated damage figure given.
Marshall County, Ind.	28	6 p.m.					30,000		do	Metal reprocessing plant destroyed, roofs damaged, television antennae damaged, etc.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wabaunsee County, Kans.	28	8:30 p.m.			0	0			Tornado	Small funnel cloud observed south of Willard, but did not reach ground.
Findlay to Bellevue, including Fostoria and Tiffin, Ohio	28	Evening		50			$500,000	See remarks	Thunderstorm	Principal damage to roofs, trees, cars crushed under falling trees, signs, radio antennae, electric and telephone lines, etc. Slight damage to fruit trees.
Braddock, Pa.	28	Evening							Electrical	Lightning started fire in upholstery plant. Stocks of lumber, cloth, and varnish destroyed.
Coastal area around Los Angeles Harbor, Calif.	28-29	Midnight 28th to midnight 29th			3		300,000		Wind	Estimated damages to marine installations and craft amounted to $250,000 and about $50,000 additional damage to trees, utility poles, signs, plate glass, television antennae, etc.
Placer, El Dorado, Sacramento, and Amador Counties, and Lower San Joaquin Valley districts, Calif.	28-29	2 p.m. 28th to 6 p.m. 29th						$1,000,000	Wind and hail	Thousands of acres of pears, plums, cherries, apples, and prunes damaged by hail. Some strawberries, peaches, grapes, and turkeys also injured.
Kane, Pa.	29	Early morning							Electrical	Lightning set fire to barn and destroyed it and contents, with $10,000 loss. Lightning burned cable on telephone lines, and set gas well on fire.
Springfield, Ill.	29	8-10 a.m.					1,250		Electrical and rain	Heavy rains caused basement and underpass flooding. Lightning-set fires resulted in damage in excess of $1,000.
Palestine, Anderson County, Tex.	29	2 p.m.	†3	12			25,000	75,000	Hail	Hailstones size of hens' eggs reported in Neches; piled 5 or 6 inches deep 3 miles north of Neches.
Visalia (about 8 miles east), Calif.	29	5:15 p.m.					4,500		Electrical	Lightning started fire which burned residence.
Oklahoma City, Okla.	29	6:30 p.m.						500	Hail	Damage to gardens.
North Dakota, entire State	29	Afternoon and evening					5,000		Wind	Strong southeasterly winds with gusts frequently to near 60 m.p.h. caused minor damage to buildings and other property at widely scattered points.
New Tripoli, Pa.	29	Evening							do	Barn about 3 miles southeast of here had stone gable end knocked out when struck by lightning.
Fort Keough, Mont.	29						15,000		do	Lightning destroyed barn containing about 400 tons of hay and a 5-ton truck.
Butte, Mont.	29-30								Snow	Cars stalled; unable to drive through heavy snow and on slick streets morning of 29th. About 1,000 phones out of order due to moisture seeping into the cables. Two sections of city without electrici for several hours.
Lewis and Clark County, Mont.	29-30								Snows and blizzard	Mountain roads closed for about 48 hours, even on main highways.
Central City, Nebr.	30	8:55 a.m.	50	1/4	0	0	1,000		Tornado	One garage wrecked, and sides of another garage and barn (attached together) blown out; also porch roof damaged. All damage confined to small area, and an observer 3 blocks distant noticed only a heavy shower and a gust of wind as shower broke.
Walstonburg, Greene County, N.C.	30	Early afternoon			1				Electrical	Man killed by lightning while working in field. Apparently, purely local thunderstorm.
Pratt County, Kans.	30	5:25 p.m.	880	10	0	0	20,000		Tornado	Storm moved northeastward. Roofs torn off. Plate glass windows blown out. Trees, light and telephone poles, and wires blown down. Path of damage about 3 blocks wide through town of Pratt.
Wayne, McClain County, Okla.	30	7 p.m.					5,000		Wind	Damage to roofs, windows, porches, and trees.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Marlow (west of), Stephens County, Okla.	30	8:30 p.m.			0	0	$2,000		Tornado	Struck in Central High and Denton communities. Several farm buildings damaged.
Springfield, Minn.	30	8:30 p.m.					500		Thunder-squalls	A small garage demolished and several small buildings damaged. Storm moved southeastward. Heavy rains accompanied storm.
Pauls Valley (south of), Garvin County, Okla.	30	9:30 p.m.	†2	2			5,000		Wind (possibly tornadoes)	Damage on several farms. Six airplanes damaged. Observer reported these as high winds over a general area, but press accounts indicate there may have been one or more tornadoes within this area.
Oklahoma City, Okla.	30	9:30 p.m.	200	8	0	0	150,000		Tornado	Path about 100 blocks long from southwestern part of Oklahoma City through city to northeastern corner. Extensive damage to commercial buildings as well as to homes. More than 1,000 places damaged in this and the following listed tornado.
Oklahoma City (northwestern section), Okla.	30	9:30 p.m.	200	1 1/2	0	0	10,000		do	Damage to many homes in 15-block path through residential section.
Waurika (20 miles east of), Jefferson County, Okla.	30	Evening					2,000		Wind	Damage to farm buildings.
Medford, Grant County, Okla.	30	Evening					1,500		Electrical	One dwelling struck and damaged by lightning.
Adams County, N.D.	30	Unknown						See remarks	Hail	The Weather Bureau's Cooperative Observer 17 miles north of Hettinger reported the hailstorm. The first real hailstorm he has seen in more than 40 years that he has been there. Possibly a 15 to 20 percent loss to crops in path.

PRELIMINARY TOTALS BY STORM TYPES FOR APRIL 1951

Type	Deaths	Injuries	Damage
Tornado	2	22	$ 399,700
Wind	7	8	1,507,800
Hail			1,209,200
Electrical	2	1	58,100
Rain			59,415
Ice	1		2,500
Total	12	31	$3,236,715

† Miles instead of yards.
‡ Yards instead of miles.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

APRIL 1951

The most damaging flood on record occurred in the Upper Mississippi Basin during the month of April. The floods were especially severe along the Minnesota River and along the main stem of the Mississippi from St. Paul, Minn., southward to Burlington, Iowa. Only minor flooding occurred along most of the tributaries below St. Paul. The Minnesota River reached a stage of 26.2 feet at Mankato, Minn., which is the highest authentic Weather Bureau gage reading ever recorded. Levels in the Mississippi River between Hastings, Minn., and Gordons Ferry, Iowa, were the highest since the maximum of record in June 1880.

Record to near record floods occurred in the East Gulf of Mexico drainage during the latter part of March and the first part of April. The floods in the Warrior and Tombigbee Rivers were the highest since 1900.

HUDSON BAY DRAINAGE.--The winter of 1950-51 was favorable for no serious flood in the spring rise of the Red River. The freezeup in the fall was comparatively a dry one and severe temperatures did not occur until after there was enough snow cover to protect the ground from deep freezing. The flood that did occur, with crests of 14.0 feet at Wahpeton, N. Dak., 26.8 feet at Moorhead, Minn., and 33.6 feet at Grand Forks, N. Dak., was due almost entirely to flooding of one tributary, the Bois de Sioux, which drains the southernmost part of the basin.

A period of mild weather in February resulted in evaporation and infiltration of a large part of the snow cover then on the ground. Large areas of bare ground, especially plowed ground, appeared in the middle part of the valley, but areas that had deeper snow cover that did not entirely disappear were protected from deep freezing.

A series of storms in late February and in March caused heavy accumulation of snow over the region south and southeast of the Red River Basin including the southernmost and easternmost parts of the basin itself.

A moisture-content survey conducted by the U. S. Engineers in mid-February showed only small amounts available for runoff, ranging from less than one inch to three inches in a few places. A survey of Weather Bureau Cooperative stations March 20-24 showed no snow or very light amounts over much of the area from the International Boundary southward to the central part of the valley. (Two exceptions, Mahnomen, Minn., 16 inches of snow cover and Hillsboro, N. Dak., 10 inches). A heavier cover over the south (upper) part of the valley was shown by reports showing 18 inches at Fergus Falls, Minn., 21 inches at Wheaton, Minn., 29 inches at Detroit Lakes, Minn., 12 inches at Campbell, Minn. On the North Dakota side, Wahpeton had a cover of 11 inches and Hankinson, 14 inches. Water equivalent of snow so late in the season was relatively high with 14 inches of snow at Fargo containing 3.16 inches on March 19.

A period of warm days began April 2, with temperatures at Fargo reaching 43°, 45°, 52° and 60°, April 2-5 inclusive. The first rise at Wahpeton occurred on April 4 when the stage was 8.76, rising from 6.43 the previous day. An aerial survey of the Red from Fargo to Breckenridge showed the ice well out of the river from Wahpeton northward for 15 miles. Ice was still in place on the Ottertail. A survey of the Bois de Sioux was not made, but would have shown the Bois de Sioux out of its banks about 7 miles south of Wahpeton, forming a lake 3 miles wide.

Crest at Fargo-Moorhead was 26.78 on the 12th. In Moorhead 39 homes were flooded, 25 of them above the first floor. In Fargo 12 homes including basement apartments were flooded, 2 above the first floor.

The flood crest smoothed out by the time it reached Grand Forks, N. Dak., aided by the temporary nature of the Red Lake River rise. Seven families were evacuated in Grand Forks, with flooding occurring above the first floor in two homes there. Crest at Grand Forks was 33.62 on the 13th.

ST. LAWRENCE DRAINAGE.--Some flooding occurred in the Lake Erie drainage along the St. Joseph River at Montpelier, Ohio, on Mar. 31st, Apr. 1st and on Apr. 30th due to locally heavy rains. No damage resulted from the flooding.

ATLANTIC SLOPE DRAINAGE.--Minor flooding occurred along the Merrimack River between Concord, N. H., and Lawrence, Mass., and on the Pemigewasset at Plymouth, N. H., between the 3d and the 6th due to heavy rainfall (1.5 to 2 inches) on the 2d and 3d. This rain was accompanied by high runoff from snow melt which had been increasing during the previous week. Damage was limited to water entering basements along the immediate banks of the river in Manchester, N. H., Lowell and Lawrence, Mass.

Excessive rainfall on the night of Mar. 30th together with warm temperatures brought on a rapid rise of the Connecticut River and its tributaries. From 1.5 to over 2.5 inches of rain occurred in a 12-hour period in the lower half of the basin and from 0.25 to 1 inch of rain supplemented by snow melt occurred over the northern half. Prior to Mar. 30th about one-third of the basin had no snow and about one-third had over 12 inches (water content over 4 inches). About the usual spring rises resulted along the main stem of the river with bankfull stage exceeded by 6 feet at Hartford, 4 feet between Holyoke and Montague City, Mass., and about 1 to 2 feet in the vicinity of Brattleboro. Some local flooding occurred 135 miles further upstream at Newbury, Vt. The river remained above flood stage at Hartford, Conn., from Mar. 31 to Apr. 18, a period of 19 days with a monthly mean stage of 15.9 feet. This was the highest monthly mean stage at Hartford since 1936 and the sixth highest since 1904. In 1920 the Connecticut River was above flood stage at Hartford for 32 days. Elsewhere this spring, flood stages persisted less than two days. No unusual damage resulted. However, on the Farmington River which was in the area where over 2.5 inches of rain occurred in a short period several roads were inundated and several basements were flooded.

Moderate rises occurred four times in the James River Basin in Virginia during the first half of the month. Flood stage was exceeded slightly at State Farm, Va., during two of these rises. The only effect of these rises was to slow up the upstream barge towing in the Richmond area.

Two significant rises occurred in the river basins of eastern North Carolina during the month due to moderate to heavy rain on the 2d, 3d, 8th and 9th. Some light flooding resulted from these rains in the Cape Fear, Neuse and lower Roanoke Basins. The only damage or monetary loss reported was in the lower Roanoke where the high water interfered with logging operations.

EAST GULF OF MEXICO DRAINAGE.--A preliminary report was made in the previous issue of this publication of the record to near record floods that occurred in the East Gulf of Mexico drainage during the latter part of March and the first part of April.

During the period Mar. 27-30, 1951, moderate to heavy rainfall occurred over the Alabama River Basin, with the heaviest 24-hour amounts being reported on the morning of Mar. 29th. Numerous stations reported 24-hour amounts of 6 inches or over. As a result of these heavy rains, flood stages were reached and exceeded at all stations in the Alabama Basin except on the Etowah and Tallapoosa Rivers. Another period of heavy rains on the 22d and 23d resulted in moderate rises, but flood stage was not reached, except on the Cahaba River at Centerville, Ala. Six lives were lost by drowning as an indirect result of these floods. The total damage from these floods exceeded two million dollars.

The severe floods in the Warrior and Tombigbee Rivers during the latter part of March and the early part of April were discussed in the previous issue. These floods were the highest since 1900; comparative crests are given in the table on East Gulf of Mexico Drainage River Crests. Another sharp rise occurred on the Warrior and Tombigbee Rivers during the last decade due to heavy rains on the 19th and 22d. General flooding resulted on the Warrior River and on the Tombigbee from Demopolis, Ala., southward. This flood was minor in comparison to the one which occurred during the latter part of March and the first part of April. Very little additional damage resulted from this flood.

The floods which resulted in the Pascagoula and Pearl Rivers from the heavy rainfall during the latter part of March continued into April. The floods on the Chickasawhay were serious in the reach from above Enterprise, Miss., to below Waynesboro, Miss., and on the Leaf from Beaumont to below Merrill, Miss. The overflows in the upper Pearl on the Yokahockany and Lobutcha drainage areas were the greatest of record. The rivers generally fell below flood stage, except on the lower Pearl, during the middle part of the month. Rises to above flood stage occurred from Jackson to Monticello, Miss., as a result of the heavy rains on the 21st. The total flood damages in the Pascagoula and Pearl Rivers during April and March were approximately one million dollars.

A comparison of the floods of 1951 with the previous maximum floods of record is given in the following table.

EAST GULF OF MEXICO DRAINAGE - COMPARATIVE RIVER CRESTS

River and station	Flood stage	1951 crest		Previous maximum crest of record	
		Crest	Date	Crest	Date
Oostanaula: Resaca, Ga.	22	34.6	Mar. 31	33.5	Jan. 21, 1947
•Conasauga: Tilton, Ga.	--	30.2	Mar. 30	27.7	Jan. 1947
•Mill Creek: Dalton, Ga.	--	8.4	Mar. 29	8.07	Nov. 1948
•Chattooga:					
Summerville, Ga.	--	21.0	Mar. 29	20.6	Nov. 1948
Gaylesville, Ala.	--	25.2	Mar. 30	24.6	Nov. 1948
Coosa: Childersburg, Ala.	20	30.1	Mar. 30	30.0	Apr. 9, 1948
Cahaba:					
Centreville, Ala.	23	34.8	Mar. 29	36.6	Apr. 8, 1938
Marion Junction, Ala.	36	41.8	Mar. 31	42.9	Aug. 17, 1939
•Choccolocco Creek: Lincoln, Ala.	--	25.5	Mar. 29	21.9	Jan. 1946
•Talladega Creek: Alpine, Ala.	--	16.6	Mar. 29	15.2	Mar. 1942
•Boguechitto Creek: Browns, Ala.	--	19.0	Mar. 29	17.2	Mar. 1945
•North: Samantha, Ala.	--	30.6	Mar. 29	26.0	Mar. 1950
Warrior:					
Tuscaloosa, Ala.	47	66.0	Mar. 29	68.6	Apr. 18, 1900
Lock No. 7, Ala.	35	56.9	Apr. 2	56.3	Feb. 8, 1936
Tombigbee:					
Aberdeen, Miss.	34	42.6	Mar. 31	44.8	Feb. 15, 1948
Gainesville, Ala.	36	52.8	Apr. 4	51.0	Feb. 21, 1948
Chickasawhay: Enterprise, Miss.	20	32.1	Mar. 30	37.2#	Apr. 16, 17, 1900
Leaf: Beaumont, Miss.	20	25.7	Apr. 1	25.4	Apr. 30, 1944
Pearl: Edinburg, Miss.	20	26.2	Mar. 31	29.0#	Mar. 1, 1902

• Reported by U. S. Geological Survey.
Prior to gage records.

UPPER MISSISSIPPI BASIN.—The most disastrous flood in the history of the Minnesota River Basin (largest tributary of the Mississippi north of St. Paul, Minn.) occurred during the 22-day period between the 6th and the 27th. Severe floods are unusual in this valley. This season, however, serious flooding developed in this valley with a crest of 26.2 feet at Mankato, Minn., which is the highest authentic Weather Bureau gage reading ever recorded. The previous record was 21.2 feet on June 26, 1908. A stage of 27.5 feet was recorded by another government agency at this point on Apr. 27, 1881. The damage this year, however, was considerably larger as North Mankato where the greatest damage occurred was practically non-existent 70 years ago. The city of Mankato was also a comparatively small town (pop. 5,500) in 1881. Water ranged in depth from several inches to 10 feet over North Mankato and forced evacuation of residents.

The discharge volume of the Minnesota River together with the moderately heavy flow of the Mississippi above the mouth of the Minnesota River combined to produce the most damaging flood on record from St. Paul, Minn., southward for a stretch of over four hundred miles. Levels in the Mississippi River between Hastings, Minn. (Dam No. 2) and Gordons Ferry, Iowa, were the highest since the record maximum of June 1880. The level of the Mississippi at Clinton, Iowa, was 0.2 foot below that of the flood of 1880 and at LeClaire, Iowa, about 1 foot below that of the record flood. The total property damage was high in the Mississippi flood plain; the cities hardest hit were Winona, Minn., and La Crosse and Prairie du Chien, Wis. It was the most severe flood of its type on record, the highest stage at La Crosse being 14.9 feet on Apr. 19th. The absolute highest on record was 16.5 feet at La Crosse on June 19, 1880. The flood of 1880, however, may be classified as that of the excessive rainfall-thunderstorm type. This flood was a combination of the snow melt and rainfall type. The next highest flood of this type resulted in a crest of 14.2 feet at La Crosse on Apr. 2, 1920. No other floods approached near the 14-foot mark except the flood of Apr. 17, 1922, when the Mississippi reached a stage of 13.7 feet at La Crosse.

Contrary to the general rule, the floods on the tributaries (except the Minnesota) were not severe and only minor flooding developed on the Chippewa, Zumbro, Whitewater, Root, Kickapoo, Wisconsin and Rock Rivers. The Des Moines and other near-by tributaries were relatively low during the passage of the main-river flood crests, and overflows below Burlington, Iowa, were less severe than in the major 1947 flood. The Des Moines River, however, was in flood on three occasions during the month. The lower Des Moines crested about 6 feet above flood stage on Apr. 3-4, as a result of the March thaw. A moderate flood rise resulted from the storm of Apr. 6-7, which occurred simultaneously with the record Cedar River rise; and a third rise began in both streams from heavy rains in northern Iowa on Apr. 28-30. The maximum stage since 1929 was recorded on the Cedar River at Waterloo, Iowa, on the 9th.

A comparative flood crest table is given below which shows how the flood this year compared with previous record floods.

UPPER MISSISSIPPI BASIN - COMPARATIVE RIVER CRESTS

River and station	Flood stage	1951 crest		Previous maximum crest of record	
		Crest	Date	Crest	Date
Minnesota: Mankato, Minn.	19	26.2	Apr. 9	25.2•	June 26, 1908
Iowa: Wapello, Iowa	10	16.2	Apr. 14	16.5	June 9, 1947
Mississippi:					
St. Paul, Minn.	14	18.8	Apr. 16	19.7	Apr. 29, 1881
Hastings Dam, Minn.	15	18.9	Apr. 18	15.1	Mar. 23, 1945
Red Wing, Minn.	14	16.3	Apr. 17	15.3•	June 18, 1880
Reads, Minn.	12	15.0	Apr. 16	14.8•	June 18, 1880
Winona, Minn.	13	17.37	Apr. 19	16.9	June 18, 1880
La Crosse, Wis.	12	14.9	Apr. 19	16.5	June 19, 1880
Lansing, Iowa	18	17.8	Apr. 21	19.9•	June 20-21,1880
Prairie du Chien, Wis.	18	20.8	Apr. 21	21.3	June 22, 1880
Dubuque, Iowa	18	22.66	Apr. 22	21.7	June 23, 1880
Gordons Ferry, Iowa	13	20.6	Apr. 23	20.3	June 1880
Clinton, Iowa	16	20.7	Apr. 26	20.9•	June 25, 1880
Muscatine, Iowa	15	21.0	Apr. 29	19.5	Apr. 24, 1922
Keithsburg, Ill.	12	17.1	Apr. 29	15.5	Mar. 23, 1929
Burlington, Iowa	15	18.1	Apr. 29	17.6	May 18, 1888
Keokuk, Iowa	16	19.7	Apr. 30	21.0•	June 6, 1851
Gregory Landing, Mo.	12	20.0	Apr.29-30	21.1	May 27,28,1944
Quincy, Ill.	17	22.2	May 1	23.9	June 10, 1947
Hannibal, Mo.	16	21.9	May 1	24.1	June 9, 1947
Louisiana, Mo.	15	19.9	May 2	22.3	June 22, 1947

• Prior to gage records.

The Mississippi River flood this year was unusual in that it originated primarily in the Minnesota River Valley. The St. Croix, Chippewa, Black and Wisconsin Rivers did contribute some to the Mississippi flood flow, but below the mouth of the Wisconsin River there were no significant contributions from any of the streams in Iowa, Illinois or Wisconsin. The principal cause of the severe flood this year was the melting of the winter's accumulation o heavy snowfall which was increased considerably b the phenomenally heavy snowfall during March. Th winter snowfall itself would produce only hig stages and slight flooding but supplemented b enormous snowfalls during March it created such volumes of water that all communities along the Minnesota River from Mankato to its mouth, and from St

Paul southward on the Mississippi to the confluence with the Salt River, suffered severe inundation. The table below shows the snowfall during the winter and snowfall during March as compared to the normal accumulation.

Departure from Normal, Snowfall (unmelted, inches)
(Based on the averages for 24 stations)

Period	Snowfall	Normal	Departure
Winter season (Dec.,Jan.and Feb.)	36.9	21.2	+15.7
March	36.6	8.4	+28.2

Above normal precipitation continued during the first two weeks of April up to the time of cresting. The factors present which reduced the peak stages were, first, flood control measures by the hydroelectric reservoirs in the upper Chippewa and Wisconsin Valleys. These had been drawn down previous to the spring break-up and, therefore, stored considerable volume before they were compelled to spill excess. The second alleviating factor was the remarkable absorption of melting snow into the ground which had very little frost depth. Continued cool nights checked surface runoff to such an extent hat it permitted gradual absorption. Were it not or this, the flood would have been more severe with tages exceeding the maximum stages of record.

Damages in this flood were not of an agricultural ature as the occurrence was at a season before rops were planted and winter grains or meadows had made appreciable growth. The residential and business areas in the villages, towns and cities in he path of the near-record high water were abanoned. The St. Paul Municipal Airport was closed as water seeped and flowed over the runways. The large acking plants at South St. Paul suffered when stock ens were flooded and embargoes placed on receipt of tock. Pumping operations to remove water from asements and to protect power and heating plants ere carried on at many St. Paul installations and lso in other towns. Property damage was considerble in the residential area of Winona, Minn., La rosse and Prairie du Chien, Wis., where many baseents and even first floors were flooded to a depth ever before experienced by present inhabitants. everal industrial concerns had to shut down, sewage isposal operations were curtailed and even raiload schedules interrupted. One hundred and foureen families in La Crosse requested Red Cross aid, 0 families required shelter and about 50 families ere evacuated. The north side of La Crosse being f lower elevation had the most damage, covering an rea exceeding forty square blocks. Many basements ere flooded by seepage through the sandy soil peritting a rapid rise in the ground water table. amage in Winona was slightly greater than in La rosse but diking there saved considerable propery. Prairie du Chien apparently had more damage han La Crosse or Winona in proportion to the total opulation. Property damages along the "Big" River ere extraordinarily heavy.

MISSOURI BASIN.--The Floyd River in Iowa was in flood from Mar. 26 through Apr. 8; the overflows resulted from snow melt. The first rise resulted n a crest of 19.9 feet at James, Iowa, on Mar. 28th (flood stage 16 feet). The second rise resulted in a crest of 18.5 feet. Most of the damages resulting from this flood occurred during the last 5 days of March.

The Big Sioux River reached its highest stage in 70 years at Akron, Iowa, on Apr. 6th when it reached a crest of 19.7 feet. This flood resulted from snow melt and ice jams. Lowland flooding was extensive all the way from Volga, S. Dak., down to the mouth of the Big Sioux. The most severe urban flooding occurred at Sioux Falls. Some flooding occurred at Stevens, S. Dak., across the river from Sioux City, Iowa. Flood losses have been estimated as high as a million dollars.

Severe flooding occurred in the Little Sioux River at Correctionville, Iowa, between the 5th and the 12th. The crest of 22.55 feet on the 8th exceeded the previous record stage of 21.93 feet at this point on Aug. 5, 1945. This record flood resulted from snow melt and rainfall. The greatest damage along the Little Sioux resulted in the Spencer, Iowa, area where several residents had to be evacuated.

Damage downstream below Spencer appears to have consisted chiefly of damage to farmland, although some damage to farm homes did occur.

Some flooding occurred along the Little Blue River at Endicott, Nebr., on Apr. 25th and 26th due to heavy rain on the 20th, 21st and 25th. Only negligible damages resulted from the flooding.

Two series of flash floods developed on the Grand and Chariton Rivers in Missouri due to moderately heavy rains. The rain averaged 1.55 inches over the Grand Basin and 1.20 inches over the Chariton River Basin, between the 6th and 9th. Normally, this amount of precipitation would not have produced the sharp rises that resulted. However, during the last week of March, moderate to heavy precipitation occurred over the central portion of the Missouri in the form of rain or snow. An average of 2-4 inches of snow was reported over the Grand and Blackwater-Lamine River Basins on Mar. 30th. Light precipitation averaging about 0.6 inch occurred again over central Missouri between the 11th and 13th. Due to the high moisture content of the soil and the amount of water in the streams these amounts of precipitation were sufficient to cause the Grand and Lamine Rivers to overflow.

Slight flooding occurred during the first week in April on the Missouri River over the lowest bottom lands between Williston and Bismarck, N. Dak. About 12 families had to be moved but damage to property was slight. Some additional minor flooding occurred further downstream along the main stem between Nebraska City, Nebr., and Waverly, Mo., and at Grafton and Chester, Ill., between the 9th and 18th.

OHIO BASIN.—Moderately heavy rains (0.75 inch) on the 1st and 2d caused some flooding in the upper Allegheny Basin on those dates. No damage resulted from this overflow.

Daily rains during the period from the 6th through the 13th caused gradual rises to a little above flood stage along the lower West Fork and main White Rivers and at most points along the Wabash River from LaFayette, Ind., downstream. The rains were mostly light except for one or two days when daily averages were about 0.5 to 0.75 inch. No damage of consequence resulted from these overflows.

The Tennessee River remained above flood stage at points along its lower reaches at the beginning of April as a result of the general heavy rains over the Tennessee River Basin during the last week in

March. An account of this high water was given in the March issue of this publication. South Chickamauga Creek overflowed on two occasions during the month due to heavy local rainfall.

On Mar. 28th the Ohio River from Dam No. 47 to Cairo, Ill., having reached flood stage earlier in the month, was below flood stage and falling at all stations, except in the reach between Mount Vernon, Ind., and Dam No. 50 where it was still above flood stage. Effective rains began falling over a wide area on Mar. 27th and continued intermittently for about one week. The rainfall was heavy over the Tennessee Valley (2.7 inches) but mostly light elsewhere; these rains were sufficiently heavy to start another rise which culminated in crests above flood level at and below Dam No. 50. The Ohio fell below flood stage before the end of April at all points except at Cairo, Ill. Nearly 58,000 acres were inundated along the main stem at and below Dam No. 50, 18,000 acres of which were arable. No loss of prospective crops is expected since there is plenty of time left for the flood waters to recede from the submerged farm lands. Some loss resulted in wages from the suspension of construction operations on a new bridge across the Ohio River at Cairo, Ill.

WHITE RIVER BASIN.--Flooding on the White River during April 1951 was due to the continued high water from the previous month. No additional damage was reported. Flooding on the Black River during April 1951 was due to secondary rises on high stages continuing from the previous month. Damage was negligible since this same area was flooded during the previous month. However, the continued high water prevented the use of the land for agricultural purposes.

LOWER MISSISSIPPI BASIN.--The Tallahatchie and Yazoo Rivers began rising moderately from the heavy rains in late March. The Tallahatchie crested at Swan Lake, Miss., at a stage of 28.5 feet on Apr. 4, 2.5 feet above flood stage and the Yazoo at Greenwood, Miss., at a stage of 36.9 feet on Apr. 6, 1.9 feet above flood level. The Yazoo River showed little change further downstream at Yazoo City, Miss., during April, changing only 0.9 foot during the entire month. A report of the flood damage over the lower Yazoo is not yet available. Apparently, the very intense rain on Mar. 27-28 poured water into the Yazoo so rapidly that quite a bit of water collected in areas where it is not readily removable except over a long period. One competent observer reports that land that he has never before seen covered this late in the season still remains inundated; this area is from Yazoo City, Miss., northward for about 50 miles. Since the Mississippi is falling quite slowly the rate of removal of water will be very slow from Yazoo City northward into the affected area.

Two rises occurred along the main stem of the lower Mississippi River during April. The first rise resulted from the heavy rains over the Missouri and upper Mississippi Basins on Mar. 28 and 29 together with the ice break-up. The second rise resulted from the heavy rains on Apr. 22d over the Tennessee, Cumberland, and lower Ohio Basins. The precipitation averaged 1.5 inches with 2.59 inches at Cairo, Ill. Although the Mississippi River has been above flood stage at New Madrid and Caruthersville, Mo., since Feb. 23, except for the latter half of March, no severe damages have been reported.

ATCHAFALAYA BASIN.--The Atchafalaya River continued in flood at Atchafalaya, La., from Feb. 13th through April. The river at Atchafalaya ranged from 27.1 feet on the 5th and 6th to 27.6 feet on the 16th and 17th. Some local flooding resulted at Morgan City, La., on the 7th due to tides and onshore winds. No damage has been reported from the flooding.

WEST GULF OF MEXICO DRAINAGE.--The only flooding in the West Gulf of Mexico drainage during April was in the Sabine Basin at Bon Weir, Tex. A report of this flood was made in the previous issue of this publication.

A record low stage was observed on the Brazos River at Richmond, Tex., on the 29th when a stage of 0.2 foot was observed. The previous low stage was 0.4 foot observed on Aug. 23, 1934.

The drought conditions in the lower Rio Grande continued throughout April at Brownsville, Tex. There were very few days that there was any flow past the gage at Brownsville.

COLUMBIA BASIN.--Due to the combination of a heavy snow cover in all the mountains and persistently warm weather during April, all southern Idaho rivers and streams continued swollen and at stages well above average for the time of the year. Near bank-full stages were reached about the 15th. Because of the particularly rapid local melting on their headwaters, the Big Wood and Portneuf (small tributaries of the middle Snake) had minor rises and bank-full stages from about the 13th to the 15th, occasioning some alarm in adjacent areas but little or no material damage. The upper Snake and Henrys Fork were at their highest stages as the month closed.

FLOOD STAGE DATA

(All dates in April unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest*	
		From–	To–	Stage	Date
	Ft.			Ft.	
HUDSON BAY DRAINAGE					
Red of North:					
Wahpeton, N. Dak.	10	4	11	14.0	7
Moorhead, Minn.	17	6	16	26.8	12
Grand Forks, N. Dak.	30	8	20	33.6	13
ST. LAWRENCE DRAINAGE Lake Erie					
St. Joseph: Montpelier, Ohio	10	30	30	10.7	30
ATLANTIC SLOPE DRAINAGE					
Bakers: West Rumney, N. H.	7	3	4	9.0	3
Pemigewasset: Plymouth, N. H.	11	3	4	12.6	4
Merrimack:					
Franklin Junction, N. H.	14	3	5	16.3	4
Concord, N. H.	12	4	6	14.4	4
Garvins Falls, N. H.	5.5	4	6	6.6	5
Manchester, N. H.	7	4	6	8.0	5
Connecticut:					
South Newberry, Vt.	22	4	5	23.3	4
Montague City, Mass.	28	Mar. 31 3	2 4	32.3 29.6	1 4
Holyoke, Mass.	9	Mar. 31 3	2 4	10.0 9.3	1 4
Hartford, Conn.	16	Mar. 31	18	22.1	2
James: State Farm, Va.	12	2 4	2 4	12.9 12.3	2 4
Roanoke: Williamston, N. C.	10	7	26	11.3	18
Neuse:					
Neuse, N. C.	14	5 10	5 12	14.3 14.9	5 11
Smithfield, N. C.	13	6 10	6 13	13.5 14.3	6 12
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	5 10	5 13	20.8 26.7	5 11
Pee Dee: Pee Dee, S. C.	19	11	16	20.5	14
EAST GULF OF MEXICO DRAINAGE					
ostanaula:					
Resaca, Ga.	22	Mar. 29	1	34.6	Mar. 31
Rome, Ga.	25	Mar. 29	6	30.5 30.0	Mar. 30 2
oosa:					
Gadsden, Ala.	20	Mar. 29	11	28.9	Mar. 31
Childersburg, Ala.	20	Mar. 29	2	30.1	Mar. 30
Wetumpka, Ala.	45	Mar. 29	1	47.9	Mar. 30
ahaba:					
Centreville, Ala.	23	Mar. 28 23	Mar. 31 23	34.8 23.0	Mar. 29 23
Sattle, Ala.	32	Mar. 29	2	42.0	Mar. 31
Marion Junction, Ala.	36	Mar. 30	3	41.8	Mar. 31
labama:					
Montgomery, Ala.	35	Mar. 30	5	44.6	1
Selma, Ala.	45	1	5	48.0	2-3
Millers Ferry, Ala.	40	Mar. 30	12	49.9	5
lack Warrior:					
Tuscaloosa Lock and Dam, Ala.	47	Mar. 29 23	2 23	66.0 50.2	Mar. 29 23
Lock No. 9	30	Mar. 29 23	9 26	48.5 37.4	Mar. 31 24
Lock No. 8	30	Mar. 29 22	11 28	54.4 40.4	1 25
Lock No. 7, Eutaw, Ala.	35	Mar. 29 23	12 28	56.9 42.6	2 26
mbigbee:					
Aberdeen, Miss.	34	Mar. 29	4	42.6	Mar. 31
Columbus, Miss.	29	Mar. 29	5	38.0	1
Gainesville, Ala.	36	Mar. 29	14	52.8	1
EAST GULF OF MEXICO DRAINAGE (Cont'd.)					
Tombigbee: (Cont'd.)					
Lock No. 4, Demopolis, Ala.	39	Mar. 29 23	18 May 1	66.9 47.3	5 27
Lock No. 3	33	Mar. 19	May 3	63.2 49.0	7 28
Lock No. 2	46	Mar. 29 23	20 May 1	64.8 50.4	8 28
Lock No. 1	31	Mar. 21	May 4	45.8 34.7	11 30
Chickasawhay:					
Enterprise, Miss.	20	Mar. 28	2	32.1	Mar. 30
Shubuta, Miss.	30	Mar. 29	5	39.9	2
Waynesboro, Miss.	35	Mar. 30	5	39.8	3
Pascagoula: Merrill, Miss.	22	Mar. 29	9	24.6	2
Bogue Chitto: Franklinton, La.	11	Mar. 29 22	1 23	15.4 13.0	Mar. 31 22
Pearl:					
Edinburg, Miss.	20	Mar. 29	5	26.2	Mar. 31
Goshen Springs, Miss.	20	Mar. 30	9	26.4	2
Jackson, Miss.	18	Mar. 19 22	17 ••	34.4 22.4	4 26
Monticello, Miss.	15	Mar. 28 24	18 25	22.2 22.7 15.1	Mar. 31 10 24
Columbia, Miss.	17	Mar. 29	18	21.3 21.7	2 13
Bogalusa, La.	15	Mar. 18	••	19.6 19.5	6 17
Pearl River, La.	12	Mar. 19	••	16.2 16.6	3 25
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Minnesota: Mankato, Minn.	19	7	21	26.2	9
St. Croix: Stillwater, Minn.	12	15	20	13.4	17
Chippewa: Durand, Wis.	11	10	16	13.4	10
Zumbro: Theilman, Minn.	°11	8 13	9 14	12.2	14
Whitewater: Beaver, Minn.	7	7	7	7.6	7
Black: Galesville, Wis.	12	9	12	13.1	9
Root: Hokah, Minn.	47	7 13	9 14	47.6	14
Kickapoo: Steuben, Wis.	8	Mar. 30	3	8.7	1
Wisconsin:					
Wisconsin Rapids, Wis.	12	10	10	12.2	10
Portage, Wis.	17	10	17	19.1	12
Muscoda, Wis.	9	13	17	9.9	14
Rock: Moline, Ill.	10	2 30	25 ••	10.8 -----	16-17 -----
Cedar:					
Charles City, Iowa	--	-	--	18.9	8
Waterloo, Iowa	15	7 30	11 May 1	18.9 17.0	9 30
Cedar Rapids, Iowa	13	Mar. 31 9	1 13	13.6 17.3	Mar. 31 11
Iowa: Wapello, Iowa	10	1	21	13.8 16.2	4 14
Boone: Webster City, Iowa	10	6	9	10.9	7
Raccoon: Van Meter, Iowa	13	Mar. 28	3	19.0	Mar. 31
Des Moines:					
Boone, Iowa	12.5	Mar. 29 5	1 12	16.9 16.5	Mar. 30 9
Des Moines, Iowa	23	Mar. 31 8	1 12	23.8 23.7	Mar. 31 10-11
Tracy, Iowa	14	Mar. 29 25	18 29	20.1 18.7 14.8	2 14 27
Eddyville, Iowa	15	Mar. 29 25	20 ••	21.7 20.6 17.1	3 14 28

FLOOD STAGE DATA

(All dates in April unless otherwise specified)

River and station	Flood stage	Above flood stages -dates		Crest*	
		From–	To–	Stage	Date*
MISSISSIPPI SYSTEM (Cont'd.) Upper Mississippi Basin (Cont'd.)	Ft.			Ft.	
Des Moines: (Cont'd.)					
Ottumwa, Iowa	9	Mar. 29 26	19 **	15.2 14.0 10.1	1 14 28
Illinois:					
Morris, Ill.	13	14	14	13.0	14
La Salle, Ill.	20	12	19	21.7	14
Peoria, Ill.	18	15	20	18.3	17
Havana, Ill.	14	3	**	16.7	19
Beardstown, Ill.	14	Feb. 18	**	21.6 14.8 18.6	Feb. 28 3 21
Mississippi:					
Aitkin, Minn.	12	15	**	12.5	24
St. Paul, Minn.	14	12	27	18.8	16
Hastings, Minn.	15	15	20	18.9	18
Red Wing, Minn.	14	15	24	16.3	17
Reads, Minn.	12	14	25	15.0	16
Winona, Minn.	13	14	29	17.4	19
La Crosse, Wis.	12	13	31	14.9	19
Prairie du Chien, Wis.	18	16	30	20.8	21
Dubuque, Iowa	18	16	**	22.7	22
Gordons Ferry, Iowa	13	12	**	20.6	23
Clinton, Iowa	16	16	**	20.7	26
Le Claire, Iowa	12	20	**	13.5	26
Davenport, Iowa	15	18	**	18.3	28-29
Muscatine, Iowa	15	14	**	21.0	29
Keithsburg, Ill.	12	12	**	15.8 17.1	21 29
Burlington, Iowa	15	14	**	16.8 18.1	21-22 29
Keokuk, Iowa	12	Mar. 31	**	14.7 17.9 17.9 19.7	5 17 22 30
Gregory Landing, Mo.	12	Mar. 31	**	15.1 18.1 20.0	5-6 16 29-30
Quincy, Ill.	14	Mar. 30	**	17.1 20.2 22.2	6 17 May 1
Hannibal, Mo.	13	Mar. 30	**	17.3 20.1 21.9	7 18 May 1
Louisiana, Mo.	14	Mar. 31	**	15.9 16.0 18.5 19.9	7 9 18 May 2
Grafton, Ill.	18	9	**	21.7	20
Chester, Ill.	27	11	25	29.0	18
Cape Girardeau, Mo.	32	14	27	33.6	19
Missouri Basin					
Big Sioux: Akron, Iowa	12	Mar. 27	16	17.8 19.7	1 6
Floyd:					
Merrill, Iowa	12	Mar. 27 3	1 6	14.2 13.0	Mar. 28 4
James, Iowa	16	Mar. 26	8	19.9 18.4	Mar. 28 5
Little Sioux: Correctionville, Iowa	19	5	12	22.6	8
Little Blue: Endicott, Nebr.	9	25	26	10.6	26
Grand:					
Chillicothe, Mo.	18	7 13	8 14	19.4 19.8	7 13
Sumner, Mo.	25	7 13	9 11	28.3 27.5	8 14
Brunswick, Mo.	12	8	18	14.1	14
Chariton: Novinger, Mo.	20	6	10	24.1	8

River and station	Flood stage	Above flood stages -dates		Crest*	
		From–	To–	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin (Cont'd.)	Ft.			Ft.	
Lamine: Clifton City, Mo.	15	7 13	7 13	16.8 16.0	7 13
Missouri:					
Nebraska City, Nebr.	15	9	17	17.2	14
St. Joseph, Mo.	17	14	16	17.2	14
Waverly, Mo.	18	14	16	18.3	16
Hermann, Mo.	21	12	16	22.1	14
St. Charles, Mo.	25	13	18	26.6	15
Ohio Basin					
Allegheny: Olean, N. Y.	10	1	[illegible]	10.6	2
West Fork:					
Andersen, Ind.	10	11 23	14 23	10.3 10.8	13 23
Spencer, Ind.	14	15	15	14.2	15
Elliston, Ind.	18	14	17	19.4	14
Edwardsport, Ind.	12	1 9	4 23	12.9 17.4	1-2 16-17
White: Petersburg, Ind.	16	2 14	3 20	16.2 18.7	3 18-19
Wabash:					
Wabash, Ind.	12	14	15	12.2	14
La Fayette, Ind.	11	1 11	1 17	11.2 15.6	1 15
Covington, Ind.	16	12	18	19.1	15
Montezuma, Ind.	--	--	--	19.1	16
Terre Haute, Ind.	14	13	20	16.2	16-18
Hutsonville, Ill.	--	--	--	19.6	19-20
Riverton, Ind.	--	--	--	17.2	20
Vincennes, Ind.	16	21	21	16.0	21
Mount Carmel, Ill.	17	16	22	18.6	19
South Chickamauga Creek: Chickamauga, Tenn.	10	[illegible] 22	9 23	10.7 11.0	8 23
Ohio:					
Shawneetown, Ill.	33	Feb. 7 7 19	2 12 23	44.0 38.5 34.0 33.3	Mar. 2 Mar. 26 10 22
Dam No. 50, Fords Ferry, Ky.	34	Feb. 6	25	46.8 40.8 36.4 35.8	Mar. 1 Mar. 26 10 21
Paducah, Ky.	39	Mar. 31	5	40.4	4
Dam No. 2, Brookport, Ill.	37	Mar. 28 21	13 27	42.4 38.9	4 24
Dam No. 53, near Mound City, Ill.	42	Mar. 28	29	48.2	4
Cairo, Ill.	40	Mar. 29	May 1	47.5	4
White Basin					
Black: Black Rock, Ark.	14	8 12 22	8 17 27	14.7 15.6 18.3	8 13 22
White: Clarendon, Ark.	26	28	May 10	26.5	May 2
Lower Mississippi Basin					
St. Francis: St. Francis, Ark.	18	Mar. 17	Mar. 31	19.4	Mar. 22
Tallahatchie: Swan Lake, Miss.	26	Mar. 30	14	28.5	3
Yazoo:					
Greenwood, Miss.	35	2	12	36.9	6
Yazoo City, Miss.	29	Jan. 22	**	33.3 36.6	Feb. 28 Mar. 28
Mississippi:					
New Madrid, Mo.	34	1	30	37.2	5
Caruthersville, Mo.	32	2	**	35.6 34.8	6 26
Atchafalaya Basin					
Atchafalaya:					
Atchafalaya, La.	25	Feb. 13	2	28.0 27.6	Mar. 20 16-17
Morgan City, La.	6	7	7	6.2	7

* Provisional.
** Continued at end of month.
New recorder gage upstream from old gage; tentative flood stage.

RADIOSONDE DATA

Average monthly values

able 20

APRIL 1951

Standard pressure surface (mb.)	ALBANY, N. Y. (1002 MB.)				ALBUQUERQUE, N. MEX. (834 MB.)				ATLANTA, GA. (979 MB.)				BIG SPRING, TEX. (921 MB.)				BISMARCK, N. DAK. (936 MB.)				BOISE, IDAHO (912 MB.)				BROWNSVILLE, TEX. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
RFACE	30	86	7.3	75	29	1,620	13.6	35	30	307	14.7	64	28	784	18.1	37	29	505	3.3	71	30	868	12.2	43	30	6	21.1	80
	30	103			29	54			30	128			28	70			29	137			30	80			30	107	20.9	80
	30	526	6.3	67	29	507			30	570	15.2	57	28	520			29	559			30	524			30	557	18.8	74
	30	967	3.7	69	29	972			30	1,020	12.1	59	28	934	18.2	36	29	996	2.3	55	30	975	14.2	32	30	1,015	18.3	51
	30	1,429	0.8	71	29	1,457			30	1,497	8.8	62	28	1,472	15.5	38	29	1,455	- 0.9	56	30	1,455	11.2	32	30	1,503	16.4	41
	30	1,914	- 1.9	71	29	1,968	12.0	29	30	1,996	6.3	58	28	1,982	12.4	34	29	1,936	- 3.9	51	30	1,957	7.1	37	30	2,016	14.0	40
	30	2,430	- 3.9	64	29	2,507	7.6	32	30	2,531	3.4	51	28	2,525	9.0	34	29	2,455	- 6.6	51	30	2,489	2.9	41	30	2,565	11.5	33
	30	2,968	- 6.3	57	29	3,067	2.7	36	30	3,080	0.5	51	28	3,087	4.6	36	29	2,979	- 9.4	49	30	3,058	- 1.1	43	30	3,131	8.2	33
	30	3,549	- 9.1	54	29	3,664	- 2.6	42	30	3,681	- 2.8	42	28	3,690	0.2	38	29	3,559	-12.2	46	30	3,630	- 5.2		30	3,741	4.0	38
	30	4,160	-12.5	47	29	4,290	- 7.7	45	30	4,301	- 6.7	40	28	4,322	- 4.6	34	29	4,156	-15.7	45	30	4,248	- 9.3	42	29	4,382	- 0.8	41
	30	4,821	-16.5	43	29	4,965	-12.9	48	30	4,980	-11.1		27	5,004	- 9.6	34	29	4,818	-19.4	41	30	4,920	-13.6	36	29	5,073	- 5.7	37
	30	5,529	-21.3	40	28	5.676	-18.2	45	30	5,700	-16.1		25	5,735	-14.7		28	5,512	-24.1	43	30	5,634	-18.7	36	29	5,810	-10.8	38
	30	6,297	-26.7	40	28	6,158	-23.5	58	29	6,488	-21.7		25	6,525	-20.7		26	6,285	-29.3	44	29	6,411	-24.6		29	6,617	-16.2	38
	30	7,138	-32.7		28	7,307	-29.7		29	7,339	-27.8		25	7,383	-27.4		26	7,106	-35.1	47	29	7,254	-31.0		29	7,490	-22.4	40
	29	8,063	-39.8		28	8,243	-37.2		29	8,285	-35.0		24	8,327	-34.9		25	8,023	-41.7		29	8,186	-38.5		29	8,456	-29.4	41
	30	9,100	-46.9		27	9,289	-45.7		28	9,335	-43.1		24	9,386	-42.8		26	9,052	-49.0		29	9,226	-47.1		29	9,536	-37.9	
	30	10,289	-53.5		26	10,485	-54.4		27	10,535	-51.9		23	10,585	-51.8		25	10,231	-55.6		27	10,423	-56.1		28	10,767	-47.3	
	30	11,711	-56.0		26	11,888	-60.8		27	11,957	-58.2		21	12,007	-59.2		22	11,645	-58.2		27	11,821	-61.4		29	12,207	-57.9	
	30	12,560	-55.8		26	12,717	-61.3		26	12,792	-59.4		17	12,828	-60.4		22	12,490	-55.9		26	12,651	-60.2		28	13,034	-62.9	
	29	13,544	-55.3		25	13,680	-60.7		25	13,760	-58.9		15	13,792	-60.1		21	13,471	-55.4		26	13,616	-58.5		28	13,977	-65.3	
	28	14,705	-55.5		25	14,812	-61.0		25	14,901	-59.9		15	14,916	-62.2		17	14,646	-56.3		25	14,763	-58.4		27	15,083	-67.0	
	28	16,123	-56.7		24	16,188	-63.4		24	16,282	-62.5		14	16,292	-64.4		14	16,048	-57.0		24	16,165	-59.0		20	16,133	-69.3	
	26	17,532	-57.3		21	17,566	-63.0		21	17,654	-63.5		14	17,651	-64.8		10	17,459	-57.8		24	17,562	-58.9		18	17,758	-70.7	
	23	19,361	-57.2		15	19,343	-61.5		14	19,431	-60.6		13	19,411	-62.0		7	19,294	-59.1		20	19,371	-58.9		14	19,481	-65.6	
	17	20,508	-56.7		8	20,479	-58.8		11	20,571	-59.0		10	20,529	-59.3		6	20,440	-58.5		8	20,525	-58.4		12	20,601	-61.5	
	11	21,924	-56.2										5	21,948	-55.9										10	21,997	-56.1	
																									6	23,850	-52.0	

Standard pressure surface (mb.)	BUFFALO, N. Y. (986 MB.)				BURRWOOD, LA. (1015 MB.)				CAMAGUEY, CUBA (10 2 MB.)				CARIBOU, MAINE (983 MB.)				CHARLESTON, S. C. (1014 MB.)				CIUDAD VICTORIA, MEX. (971 MB.)				COLUMBIA, MO. (984 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
ACE	30	221	5.9	82	30	3	17.7	89	29	122	22.1	88	30	191	5.8	85	30	13	15.1	81	25	335	23.8	39	29	239	9.8	67
	30	106			30	150	18.4	79	29	143	22.0	83	30	95	3.1		30	155	17.0	73	25	67			29	103		
	30	533	6.2	71	30	574	16.6	68	29	595	21.1	81	29	516	3.9	75	30	579	15.6	59	25	527	27.0	41	29	536	9.5	59
	30	969	3.7	67	30	1,029	14.3	63	29	1,057	13.8	72	30	951	1.5	75	30	1,030	12.4	61	25	999	22.6	48	29	977	6.8	61
	30	1,431	0.8	69	30	1,510	11.9	53	29	1,546	16.2	67	30	1,409	- 0.9	77	30	1,507	9.5	56	25	1,493	18.4	53	29	1,445	4.3	61
	30	1,916	- 1.9	66	30	2,016	9.8	42	29	[illegible]	12.9	65	30	1,891	- 3.4	76	30	2,008	6.5	52	25	2,009	14.7	59	29	1,936	1.9	59
	30	2,432	- 4.4	63	30	2,553	7.2	35	29	2,603	10.0	53	30	2,405	- 6.0	76	30	2,542	4.2	43	25	2,560	11.7	59	29	2,462	- 0.1	51
	30	2,967	- 7.1	59	30	3,113	4.2	32	29	3,171	7.2	42	30	[illegible]	- 8.9	65	30	3,094	1.9	36	25	3,129	9.5	50	29	3,005	- 2.6	43
	30	3,550	-10.2	55	29	3,720	1.0	27	29	3,783	3.8	57	30	3,516	-11.8	56	30	3,695	- 1.7	33	25	3,745	5.6	50	29	3,596	- 6.2	46
	30	4,155	-13.4	47	29	4,353	- 3.1		28	4,424	0.1	32	30	4,116	-15.4	52	30	4,321	- 5.7		25	4,390	0.8	51	29	4,210	-10.2	46
	30	4,816	-17.3	44	29	5,042	- 7.9		28	5,114	- 4.1	30	30	4,772	-19.3	46	30	5,002	-10.4		25	5,086	- 4.0	50	29	4,881	-14.5	42
	28	5,528	-21.7	40	29	5,770	-13.1		28	5,861	- 8.6		30	5,470	-23.9	45	30	5,724	-15.6		24	5,828	- 8.8	45	29	5,590	-19.4	43
	28	6,299	-27.1	41	29	6,574	-18.5		27	6,674	-14.1		30	6,234	-29.1	43	30	6,519	-21.0		23	6,644	-14.2	46	29	6,370	-24.9	39
	27	7,129	-33.4		29	7,434	-24.5		27	7,555	-20.4		30	7,064	-35.0		30	7,373	-27.0		23	7,524	-20.1	44	29	7,210	-31.3	38
	26	8,066	-39.7		28	8,388	-31.7		27	8,531	-27.4		29	7,986	-41.3		30	8,321	-34.2		23	8,500	-27.3		29	8,142	-38.0	
	24	9,087	-47.0		28	9,460	-39.6		27	9,622	-35.7		29	9,019	-47.5		30	9,381	-42.2		23	9,591	-35.7		29	9,187	-45.6	
	22	10,261	-52.8		28	10,682	-48.5		25	10,366	-45.2		28	10,208	-52.2		30	10,590	-51.4		23	10,833	-45.8		29	10,380	-53.4	
	18	11,726	-55.9		25	12,110	-58.1		25	12,323	-55.5		28	11,644	-53.5		30	12,010	-59.1		23	12,282	-57.0		29	11,797	-57.5	
	16	12,573	-55.2		26	12,943	-61.5		25	13,164	-60.4		[illegible]	12,505	-52.1		30	12,811	-60.1		22	13,119	-62.5		28	12,634	-56.7	
	13	13,556	-55.6		26	13,894	-62.9		[illegible]	14,115	-61.9		[illegible]	13,504	-52.6		30	13,806	-59.5		21	14,058	-66.5		26	13,603	-56.5	
	8	14,691	-54.5		24	15,019	-61.0		[illegible]	15,216	-68.7		25	14,631	-53.9		30	[illegible]	-60.6		19	15,163	-67.6		24	14,741	-56.6	
	7	16,124	-55.8		21	16,392	-66.2		23	16,540	-72.2		22	16,112	-55.0		30	16,322	-63.1		13	16,527	-68.9		24	16,149	-58.0	
	6	17,534	-54.7		21	17,741	-66.8		25	17,846	-73.8		20	17,536	-55.2		28	17,692	-63.2		11	17,865	-71.1		19	17,550	-58.4	
	6	19,364	-56.3		11	19,196	-65.2		16	19,532	-69.6		11	19,369	-55.3		21	19,473	-61.3		7	19,590	-69.9		14	19,365	-58.0	
	6	20,523	-55.7		7	20,656	-59.2		15	20,654	-63.9		6	20,552	-55.2		[illegible]	[illegible]	-58.1		6	20,677	-65.8		10	20,520	-57.6	
									13	22,017	-58.5						11	22,025	-55.5						5	21,971	-55.1	
									6	23,345	-54.1																	

Standard pressure surface (mb.)	DODGE CITY, KANS. (921 MB.)				EL PASO, TEX. (878 MB.)				ELY, NEV. (805 MB.)				GLASGOW, MONT. (940 MB.)				GRAND JUNCTION, COLO. (813 MB.)				GREAT FALLS, MONT. (886 MB.)				GREENSBORO, N. C. (983 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
ACE	30	792	8.7	60	30	1,195	17.5	27	30	1,908	7.6	55	30	[illegible]	4.5	53	30	1,474	11.3	10	30	1,128	6.1	48	30	273	11.7	67
	30	101			30	61			30	78			30	[illegible]			30	[illegible]			30	119			30	123		
	30	537			30	518			30	[illegible]			30	558			30	513			30	551			30	559	13.7	52
	30	985	10.9	46	30	987			30	979			30	998	1.3	42	30	969			30	999			30	1,011	10.9	53
	30	1,460	8.7	45	29	1,472	17.3	23	30	1,456			30	1,460	1.2	43	30	1,418			30	1,465	4.5	43	30	1,485	7.7	55
	30	1,959	6.1	45	30	1,984	12.9	26	30	1,961	9.2	46	30	1,944	- 2.3	46	30	1,956	10.0	34	30	1,956	0.8	47	30	1,982	4.6	54
	30	2,491	3.1	43	30	2,525	8.8	39	30	2,496	5.5	47	30	2,462	- 5.3	44	30	2,493	5.6	38	30	2,476	- 3.1	52	30	2,509	1.8	53
	30	3,041	- 0.1	39	30	3,088	4.2	36	30	3,052	1.1	52	30	2,992	- 8.7	42	30	3,048	0.9	44	30	3,014	- 6.2	52	30	3,059	- 1.2	50
	30	3,637	- 4.0	38	30	3,689	- 0.3	41	30	3,643	- 3.5	57	29	3,573	-11.7	34	30	3,642	- 4.2	51	30	3,597	- 9.8	52	30	3,652	- 4.3	46
	30	4,257	- 8.0	41	30	4,320	- 5.3	39	30	4,271	- 7.9	57	28	4,176	-14.4	35	30	4,263	- 9.3	58	30	4,203	-13.5	48	30	4,274	- 7.7	39
	30	4,930	-12.8	42	29	5,001	-10.1	38	30	4,943	-12.6	55	28	4,835	-18.4	56	30	4,935	-14.1	56	30	4,866	-17.6	46	30	4,950	-12.1	35
	30	5,647	-18.0	41	29	5,725	-15.3	33	30	5,663	-17.5	48	28	5,535	-23.1	56	30	5,615	-19.5	54	30	5,565	-22.5	42	30	5,668	-16.9	34
	30	6,426	-23.7	38	28	6,516	-21.1		30	6,415	-23.4	45	27	6,300	-28.6		30	6,424	-24.9	45	30	6,336	-27.8	40	30	6,457	-22.4	32
	30	7,275	-30.2	36	27	7,372	-27.1		30	7,293	-30.2	45	27	7,128	-34.6	36	30	7,266	-31.1	42	30	7,167	-34.0	37	30	7,306	-28.8	
	30	8,209	-37.5		27	8,319	-34.6		30	8,228	-37.9		27	8,047	-41.4		30	8,199	-38.2	45	30	8,088	-40.8		30	8,247	-36.2	
	30	9,255	-45.0		27	9,377	-42.6		30	9,271	-46.0		26	9,082	-48.2		30	9,241	-46.5		30	9,119	-48.5		30	9,299	-44.0	
	28	10,442	-52.7		27	10,534	-51.5		28	10,171	-54.6		26	10,263	-55.2		29	10,424	-55.0		26	10,301	-56.0		29	10,507	-52.1	
	27	11,855	-58.0		25	12,008	-58.7		26	11,879	-61.6		24	11,665	-57.3		27	11,832	-60.1		24	11,704	-59.3		29	11,929	-58.1	
	26	12,693	-56.7		23	12,811	-61.8		21	12,708	60.8		22	12,510	-55.5		26	12,667	-59.1		22	12,548	-57.1		28	12,770	-58.6	
	26	13,669	-56.1		23	13,797	-61.4		21	13,672	-58.3		21	13,495	-55.0		26	13,635	-57.5		21	13,526	-56.1		27	13,733	-57.5	
	26	14,824	-57.3		23	14,925	-62.1		21	14,817	-58.9		20	14,659	-55.1		21	14,779	-58.1		20	14,683	-56.4		24	14,876	-57.7	
	25	16,234	-58.6		19	16,296	-61.8		21	16,219	-60.4		13	16,080	-56.4		22	16,177	-59.4		19	16,093	-57.5		21	16,277	-59.3	
	25	17,632	-59.3		17	17,662	-64.6		15	17,622	-61.1		15	17,490	-57.2		21	17,572	-59.8		18	17,493	-58.0		16	17,646	-59.6	
	17	19,445	-59.5		11	19,430	-65.5		13	19,415	-59.2		13	19,306	-57.4		15	19,372	-59.2		17	19,303	-57.9		9	19,479	-59.4	
	11	20,582	-57.7		6	20,553	-59.9		9	20,568	-58.6		10	20,453	-57.2		9	20,502	-58.8		14	20,446	-57.9					
	5	21,948	-55.3						7	21,932	-57.8		5	21,892	-56.4		6	21,908	-56.5		9	21,863	-57.0					

hese average values for standard pressure surfaces were obtained by radio- des; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Standard pressure surface (mb)	HATTERAS, N. C. (1015 MB.)				HAVANA, CUBA (1010 MB.)				HILO, T. H. (1015 MB.)				INTERNAT. FALLS, MINN. (970 MB.)				JOLIET, ILL. (990 MB.)				LAKE CHARLES, LA. (1014 MB.)				LANDER, WYO. (826 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	3	15.0	80	30	19	22.8	81	30	9	23.4	72	30	361	1.4	76	30	179	6.4	79	30	5	17.3	80	30	1,696	5.0	53
1,000	30	131	15.3	72	30	134	22.9	83	30	140	21.9	73	30	115			30	95			30	125	17.9	72	30	97		
950	30	572	13.3	60	30	588	20.8	77	30	586	18.2	78	29	531	2.7	65	30	521	6.7	69	30	567	15.7	66	30	532		
900	30	1,018	10.6	60	30	1,048	18.4	73	30	1,045	14.7	82	30	966	0.1	66	30	959	3.9	68	30	1,020	13.4	63	30	986		
850	30	1,492	7.7	58	30	1,536	15.6	69	30	1,527	11.7	85	30	1,422	- 2.3	68	30	1,422	1.3	68	30	1,500	11.5	53	30	1,457		
800	30	1,989	5.1	51	30	2,049	13.1	61	30	2,033	9.8	73	30	1,902	- 4.8	67	30	1,908	- 1.4	67	30	2,005	9.5	40	30	1,954	4.9	47
750	30	2,519	2.7	45	30	2,596	10.2	58	30	2,578	8.9	44	30	2,414	- 6.3	63	30	2,424	- 3.3	66	30	2,546	6.9	37	30	2,480	1.2	49
700	30	3,069	- 0.2	41	30	3,161	7.2	50	30	3,138	6.6	32	30	2,945	- 8.7	61	30	2,964	- 5.8	63	30	3,101	3.5	32	30	3,027	- 2.7	55
650	30	3,566	- 3.2	30	28	3,776	3.8	40	30	3,746	4.1		30	3,523	-11.5	55	30	3,545	- 9.0	59	29	3,704	- 0.2	28	30	3,617	- 6.7	56
600	29	4,288	- 7.0		30	4,414	0.2	33	30	4,390	0.8		30	4,126	-15.0	54	30	4,157	-12.7	53	30	4,334	- 4.2		30	4,231	-11.0	53
550	29	4,961	-11.4		29	5,110	- 4.3	31	30	5,083	- 3.7		30	4,783	-18.8	52	30	4,816	-16.9	47	30	5,019	- 8.8		30	4,897	-15.7	52
500	29	5,681	-16.6		30	5,852	- 8.7	28	30	5,828	- 8.9		30	5,483	-23.5	50	30	5,524	-21.7	45	30	5,746	-13.9		30	5,605	-20.6	46
450	29	6,477	-22.3		29	6,672	-14.1		30	6,642	-14.9		30	6,245	-28.9	50	29	6,286	-27.5	39	30	6,539	-19.8		30	6,380	-26.3	41
400	29	7,322	-28.7		30	7,545	-20.8	29	30	7,516	-21.5		30	7,077	-35.1	47	29	7,121	-33.6	38	30	7,400	-26.6		30	7,216	-32.6	
350	29	8,264	-35.7		29	8,518	-27.8		29	8,481	-29.2		30	7,993	-42.1		28	8,044	-40.2		30	8,350	-33.5		30	8,143	-39.6	
300	29	9,318	-43.6		30	9,606	-36.2		29	9,566	-37.5		29	9,020	-49.5		29	9,079	-47.3		30	9,114	-41.3		30	9,179	-47.4	
250	29	10,520	-52.0		30	10,847	-45.5		29	10,802	-46.2		28	10,183	-55.7		29	10,267	-53.6		30	10,627	-50.0		30	10,360	-56.1	
200	[illegible]	11,937	-59.4		30	12,299	-55.7		28	12,252	-55.8		22	11,605	-55.7		29	11,691	-55.7		30	12,054	-58.7		28	11,758	-60.0	
175	[illegible]	12,763	-60.0		29	13,139	-60.4		27	13,093	-60.8		20	12,437	-54.1		28	12,544	-55.8		30	12,886	-61.6		28	12,595	-57.7	
150	[illegible]	13,713	-58.0		28	14,089	-64.8		27	14,040	-65.7		20	13,426	-53.9		27	13,531	-55.5		30	13,838	-62.2		28	13,570	-56.4	
125	[illegible]	[illegible]	-59.7		25	15,189	68.7		24	15,131	-69.4		20	14,595	-54.1		24	14,694	-55.5		28	14,972	63.5		26	14,723	-57.0	
100	19	16,240	-61.0		24	16,513	-71.6		18	16,468	-73.5		18	16,013	-54.6		19	16,132	57.5		28	16,331	-66.6		24	16,133	-58.1	
80	[illegible]	17,615	-60.6		21	17,827	-72.6		14	17,777	-73.3		14	17,430	-55.7		14	17,549	58.0		27	17,679	-67.1		20	17,536	-58.3	
60	17	[illegible]	-59.6		16	19,528	-68.8		13	19,476	-66.4						9	19,375	-58.7		23	19,427	-64.2		16	19,343	-58.0	
50	13	20,538	-58.0		13	20,632	63.8		11	20,590	-61.6						5	20,521	-58.6		17	20,549	-61.7		12	20,499	-57.0	
40	9	21,944	-56.4		10	22,015	-58.6		10	21,982	-58.0										16	21,947	-57.6		5	21,905	-56.2	
30									7	23,819	-52.6										7	23,774	-54.5					

Standard pressure surface (mb)	LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1004 MB.)				MAZATLAN, MEXICO (1009 MB.)				MEDFORD, ORE. (966 MB.)				MERIDA, MEXICO (1009 MB.)				MIAMI, FLA. (1016 MB.)				NANTUCKET, MASS. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	660	19.7	22	30	79	14.7	65	29	14	23.4	75	30	401	15.1	51	30	27	26.9	66	30	4	22.2	77	30	14	6.7	87
1,000	[illegible]	51			30	110			29	89	22.8	72	30	103			30	106	26.1	67	30	141	21.8	74	30	110	7.7	79
950	30	500			29	549	14.0	59	29	541	23.3	38	30	543	16.9	41	30	559	23.5	66	30	588	19.1	73	29	534	7.1	66
900	30	967	19.3	22	30	1,000	11.4	60	29	1,007	22.6	26	30	999	13.[illegible]	43	30	1,028	21.2	65	30	1,049	16.5	71	30	976	4.5	68
850	30	1,434	15.2	24	30	1,475	8.4	64	29	1,502	20.0	24	30	1,478	10.0	48	30	1,521	18.5	63	30	1,534	14.0	63	30	1,439	2.1	68
800	[illegible]	1,963	10.8	30	30	1,974	6.1	61	29	2,021	16.9	20	30	1,978	6.3	53	30	2,039	15.2	70	30	2,044	11.8	52	30	1,927	- 0.1	59
750	[illegible]	2,498	6.2	[illegible]	30	2,507	3.5	57	29	2,573	13.2		30	2,513	2.6	56	30	2,589	12.1	63	30	2,586	9.2	47	30	2,446	- 2.4	52
700	[illegible]	3,057	1.6	[illegible]	30	3,058	0.8	52	29	3,143	9.3		30	3,058	- 1.1	46	30	3,159	9.1	50	30	3,150	5.8	45	30	2,987	- 4.8	50
650	[illegible]	3,651	- 2.7	39	30	3,656	- 2.7	50	29	3,756	5.1		30	3,652	- 4.8	37	30	3,779	5.9	34	29	3,758	2.1	43	30	3,569	- 8.1	50
600	[illegible]	4,279	- 7.1	38	30	4,280	- 6.7	45	29	4,400	0.6	34	30	4,271	- 8.9	33	30	4,421	2.0	29	29	4,396	- 1.6	38	30	4,184	-11.8	44
550	[illegible]	4,955	-12.0	36	30	4,960	-11.1	43	29	5,093	- 4.2	38	30	4,944	-13.5		30	5,116	- 2.3		29	5,087	- 5.9		29	4,845	-15.9	44
500	[illegible]	5,671	-17.1		30	5,678	-16.0	37	28	5,835	- 9.1	12	30	5,656	-18.9		29	5,867	- 7.3		29	5,824	-10.7		30	5,557	-20.4	46
450	30	6,436	-23.3		30	6,470	-22.0	35	28	6,652	-15.1	18	30	6,431	-24.8		29	6,687	-13.1		29	6,632	-16.1		30	6,327	-26.0	44
400	[illegible]	[illegible]	-30.2		30	7,319	-26.6		28	7,522	-21.0	19	30	7,278	-31.1		29	7,567	-19.5		29	7,504	-22.3	37	30	7,171	-32.1	45
350	[illegible]	8,241	[illegible]		29	8,262	-35.7		28	8,492	-28.5	18	30	8,211	-38.0		28	8,545	26.7		28	8,471	-29.4		30	8,100	-38.6	
300	[illegible]	[illegible]	[illegible]		29	9,316	-43.6		28	9,578	-36.6	17	29	[illegible]	[illegible]		28	9,639	-35.0		28	9,553	-37.7		30	9,142	-46.0	
250	[illegible]	10,481	[illegible]		29	10,519	-51.9		27	10,814	-46.5		29	10,498	-55.5		27	10,885	[illegible]		28	10,784	-47.2		30	10,333	-53.2	
200	29	[illegible]	[illegible]		27	11,945	-57.9		27	12,256	-58.1		23	11,827	-61.3		27	12,344	-55.2		27	12,229	-56.6		30	11,754	-57.0	
175	29	[illegible]	[illegible]		[illegible]	12,786	58.1		25	13,087	-63.5		23	12,658	-60.1		27	13,184	-60.8		26	13,067	-60.2		28	12,595	-56.5	
150	[illegible]	[illegible]	[illegible]		26	13,755	-57.9		21	14,027	-67.2		28	13,622	58.9		22	14,131	[illegible]		24	14,014	-63.5		26	13,580	-56.2	
125	[illegible]	[illegible]	-59.7		25	[illegible]	58.1		13	15,121	-69.0		27	14,765	-59.1		17	15,221	-68.9		21	15,120	-66.3		25	14,736	-57.1	
100	29	16,230	61.1		25	16,293	-60.7		13	16,471	-71.2		22	16,160	60.8		15	16,537	-73.6		18	16,466	-69.7		25	16,143	-58.0	
80	[illegible]	17,661	[illegible]		22	17,119	-62.2		9	17,777	-74.0		20	17,536	-61.0		10	17,831	-75.2		15	17,795	-70.8		20	17,544	-57.8	
60	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	60.0		5	19,482	-69.7		15	19,321	-59.8		8	19,512	-71.5		11	19,498	-67.2		17	19,345	-57.5	
50	7	[illegible]	-58.7		[illegible]	20,581	-57.1						9	20,459	-58.6		6	20,587	-67.3		6	20,613	-63.2		11	20,495	-57.2	
40	[illegible]	21,951	[illegible]		7	[illegible]	56.7						5	21,859	-57.8										6	21,904	-56.5	

Standard pressure surface (mb)	NASHVILLE, TENN. (995 MB.)				NORTH PLATTE, NEBR. (915 MB.)				OAKLAND, CALIF. (1011 MB.)				OKLAHOMA CITY, OKLA (967 MB.)				OMAHA, NEBR. (976 MB.)				PHOENIX, ARIZ. (970 MB.)				PITTSBURGH, PA. (968 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	[illegible]	177	12.1	70	[illegible]	[illegible]	5.8	60	30	6	12.0	70	30	391	13.7	55	30	308	7.6	71	30	338	21.6	36	30	382	7.9	6
1,000	[illegible]	119			30	[illegible]			30	121	10.9	73	30	101			30	108			30	71			30	111		
950	[illegible]	[illegible]	[illegible]	57	30	[illegible]			30	556	9.6	72	30	538	13.9	52	30	[illegible]	7.3	63	30	519	22.1	28	29	541	8.3	6
900	30	[illegible]	9.0	[illegible]	30	[illegible]	6.8	[illegible]	30	1,001	10.4	58	30	992	11.7	52	30	976	4.8	66	30	985	18.7	28	30	983	5.9	6
850	29	1,472	6.5	61	30	[illegible]	4.9	56	30	1,476	9.5	44	30	1,468	9.4	51	30	[illegible]	2.5	66	30	1,472	14.8	31	30	1,449	3.1	6
800	[illegible]	1,967	3.7	[illegible]	[illegible]	[illegible]	2.0	51	30	1,977	6.9	42	30	1,969	6.8	[illegible]	30	1,929	0.9	64	30	1,980	10.5	36	30	1,938	0.5	6
750	[illegible]	[illegible]	[illegible]	57	[illegible]	[illegible]	- 0.6	[illegible]	30	2,510	3.5	39	30	2,504	4.0	43	30	2,451	- 1.1	59	30	2,516	6.2	40	30	2,459	- 2.2	6
700	29	[illegible]	[illegible]	[illegible]	30	[illegible]	[illegible]	[illegible]	30	3,060	0.1	39	30	3,054	0.6	47	30	2,994	- 3.8	54	30	3,074	2.0	[illegible]	30	2,999	- 4.9	5
650	29	[illegible]	[illegible]	[illegible]	30	3,597	- 7.1	51	29	3,651	- 1.2	39	30	[illegible]	[illegible]	44	30	[illegible]	- 7.1	53	30	3,673	- 2.1	37	30	3,583	- 7.7	5
600	29	4,253	8.7	[illegible]	30	4,209	-10.9	[illegible]	30	4,275	[illegible]	39	30	4,274	- 7.3	41	30	4,196	-10.7	52	30	4,298	- 6.1	33	30	4,197	-11.2	5
550	28	4,930	[illegible]	47	30	4,878	-15.1	[illegible]	30	[illegible]	-13.1	36	[illegible]	[illegible]	-12.3	40	30	4,863	-15.1	51	30	4,978	-11.0		[illegible]	4,864	-15.4	5
500	28	5,617	[illegible]	[illegible]	30	5,587	-20.0	41	[illegible]	5,663	-18.3	37	[illegible]	[illegible]	-17.3		[illegible]	5,571	-20.0	48	30	5,697	-16.2	35	30	5,573	-19.9	5
450	27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-25.7	37	[illegible]	[illegible]	-24.2	39	[illegible]	6,450	-23.1		[illegible]	6,353	-25.5	45	30	6,483	-22.3		30	6,351	-25.6	4
400	27	7,272	30.0	37	30	7,205	[illegible]	57	30	7,289	[illegible]	38	[illegible]	7,297	[illegible]		[illegible]	7,191	-31.9	43	30	7,334	-28.8		30	7,189	-31.8	4
350	[illegible]	[illegible]	-37.2		[illegible]	8,131	-39.5		29	[illegible]	[illegible]		[illegible]	8,236	-36.7		30	8,121	-39.0		30	8,275	-36.0		[illegible]	8,121	-38.8	
300	[illegible]	9,277	-45.0		30	[illegible]	-47.5		30	9,268	-45.7		29	9,285	[illegible]		29	9,160	-47.2		[illegible]	9,327	-43.7		29	9,161	[illegible]	
250	25	[illegible]	-53.1		30	10,350	-55.3		[illegible]	10,159	-51.2		29	[illegible]	[illegible]		28	10,355	[illegible]		29	10,522	-52.5		28	10,352	-52.8	
200	24	[illegible]	-58.0		[illegible]	[illegible]	-59.3		30	11,867	[illegible]		23	[illegible]	-58.4		25	11,744	-58.7		28	11,937	-58.7		25	11,764	[illegible]	
175	22	[illegible]	-57.9		28	12,593	-57.8		30	12,703	-59.2		27	12,739	-58.2		25	12,534	-57.1		28	12,773	-59.4		24	12,599	-56.5	
150	[illegible]	[illegible]	[illegible]		28	[illegible]	[illegible]		30	[illegible]	-58.6		27	13,709	[illegible]		25	13,562	-56.1		28	13,736	-59.8		23	13,586	-56.3	
125	[illegible]	[illegible]	-59.5		26	14,715	-56.8		27	14,819	-58.9		26	14,862	-59.4		22	14,723	-56.6		27	14,874	-61.6		23	14,744	-56.2	
100	[illegible]	16,216	-61.0		26	16,121	-58.0		[illegible]	16,210	-60.3		25	16,217	[illegible]		22	[illegible]	-57.8		27	16,252	-63.2		22	16,149	-56.6	
80					25	17,532	-58.7		25	17,595	[illegible]		25	17,629	-61.7		17	17,535	-58.5		26	17,625	-62.7		21	17,560	-57.0	
60					17	19,330	[illegible]		[illegible]	19,380	-59.4		20	[illegible]	-59.9		[illegible]	[illegible]	-58.0		20	19,398	-61.7		17	[illegible]	-56.2	
50					11	20,173	[illegible]		[illegible]	[illegible]	[illegible]		12	20,551	-58.6		7	20,515	[illegible]		12	[illegible]	-59.6		[illegible]	20,531	-56.1	
40					7	[illegible]							5	[illegible]	-56.2										8	21,939	-56.2	

The average values for standard pressure surfaces were obtained by radiosonde; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

	PORTLAND, MAINE (1009 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (975 MB.)				SAN ANTONIO, TEX. (984 MB.)				SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1007 MB.)				S. STE. MARIE, MICH. (985 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
ACE	30	20	5.9	82	30	966	3.3	51	30	317	3.8	74	30	240	19.9	55	30	19	24.3	82	30	71	11.3	82	30	221	3.1	78
0—	30	97	7.0	74	30	129			30	107			30	102			30	143	23.6	80	30	126	11.0	82	30	93		
---	30	522	5.3	69	30	556			30	531	4.3	64	30	551	19.5	52	30	593	20.8	73	30	559	9.9	76	30	518	3.8	69
---	30	958	2.8	72	30	999			30	964	2.1	61	30	1,009	16.7	50	30	1,058	18.1	75	30	1,002	10.2	60	30	949	1.7	66
---	30	1,419	0.5	75	30	1,464	2.6	47	30	1,423	- 0.2	62	30	1,495	14.5	46	30	1,546	15.9	64	30	1,477	9.6	45	30	1,408	- 1.1	67
---	30	1,904	- 1.7	69	30	1,951	- 0.8	52	30	1,907	- 2.5	62	30	2,005	11.9	44	30	2,060	14.0	53	30	1,978	6.6	45	30	1,889	- 3.7	64
---	30	2,420	- 4.6	65	30	2,469	- 3.6	55	30	2,426	- 4.5	59	30	2,547	8.5	44	30	2,602	11.4	46	30	2,509	3.2	44	30	2,402	- 6.3	59
---	30	2,955	- 6.9	58	30	3,006	- 6.3	56	30	2,958	- 6.9	56	30	3,109	5.2	37	30	3,176	8.4	41	30	3,060	- 0.1	42	30	2,933	- 9.3	58
---	30	3,535	- 9.8	52	30	3,593	- 9.3	56	30	3,540	- 9.9	55	30	3,711	1.2	32	30	3,790	5.1	38	30	3,654	- 3.7	39	30	3,511	-12.3	56
---	30	4,144	-13.1	50	30	4,198	-12.9	55	29	4,145	-13.4	54	29	4,348	- 3.2	31	30	4,433	1.6	37	30	4,277	- 7.8	37	30	4,111	-15.7	55
---	30	4,805	-17.3	45	30	4,860	-16.8	50	29	4,805	-17.5	51	28	5,032	- 7.8		30	5,131	- 2.6		30	4,950	-12.3		30	4,766	-19.7	51
---	30	5,509	-22.1	41	29	5,564	-21.7	46	29	5,510	-22.1	49	28	5,765	-13.2		29	5,879	- 6.9		30	5,670	-17.3	35	30	5,463	-24.2	47
---	30	6,276	-27.5	41	29	6,333	-27.3	41	29	6,279	-27.6	47	27	6,556	-19.1		29	6,701	-12.0		30	6,452	-22.9		30	6,227	-29.8	43
---	29	7,113	-33.6		29	7,169	-33.6		29	7,114	-33.8	47	26	7,421	-25.4		29	7,586	-18.4		29	7,306	-29.2		30	7,054	-35.6	40
---	29	8,037	-40.2		28	8,089	-40.7		29	8,036	-40.8		25	8,376	-32.2		29	8,568	-25.7		29	8,245	-36.6		30	7,970	-42.1	
---	29	9,072	-47.5		27	9,115	-48.6		29	9,066	-48.9		24	9,444	-40.0		29	9,665	-34.0		29	9,296	-44.4		30	8,998	-48.4	
---	29	10,258	-53.9		27	10,295	-55.4		29	10,243	-56.0		24	10,665	-49.0		27	10,919	-43.7		29	10,493	-53.0		29	10,179	-53.1	
---	29	11,681	-55.6		24	11,709	-57.8		29	11,655	-56.6		23	12,106	-58.3		26	12,384	-55.1		29	11,909	-58.6		27	11,611	-55.5	
---	27	12,534	-55.2		23	12,551	-56.3		28	12,506	-55.1		23	12,938	-61.6		24	13,225	-60.8		28	12,740	-58.8		27	12,465	-54.1	
---	23	13,512	-55.0		20	13,524	-55.6		25	13,481	-54.6		22	13,887	-62.3		16	14,151	-66.4		28	13,708	-58.5		26	13,457	-53.8	
---	23	14,673	-56.0		20	14,685	-55.7		22	14,655	-55.1		16	15,010	-63.8		14	15,236	-70.6		28	14,852	-59.1		23	14,644	-54.2	
---	19	16,091	-56.6		19	16,100	-57.3		18	16,086	-56.0		14	16,373	-65.3		13	16,542	-75.0		27	16,243	-61.0		21	16,066	-55.4	
---	15	17,494	-56.7		14	17,512	-57.8		11	17,531	-58.0		12	17,696	-66.9		10	17,831	-76.0		24	17,631	-61.4		18	17,482	-55.9	
---	8	19,319	-58 7		11	19,312	-58.2		7	19,347	-58.6		8	19,432	-62.2		9	19,500	-71.2		18	19,428	-60.5		12	19,299	-56.6	
---					6	20,442	-57.6						6	20,555	-58.6		8	20,586	-66.9		13	20,572	-59.0		8	20,442	-56.0	
---																					7	21,970	-57.4					

	SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1012 MB.)				TACUBAYA, MEX. (772 MB.)				TAMPA, FLA. (1017 MB.)				TATOOSH ISLAND, WASH. (1013 MB.)				TOLEDO, OHIO (989 MB.)				WASHINGTON, D. C. (1004 MB.)			
ACE	30	722	10.4	46	30	10	25.7	80	24	2,306	18.8	39	28	9	18.9	78	30	31	8.3	78	30	191	5.7	80	30	88	10.9	65
00—	30	112			30	117	25.3	81	24	16			28	151	19.2	72	30	140	8.9	68	30	99			30	120		
---	30	548			30	577	22.0	83	24	488			28	593	17.4	66	29	569	8.6	49	30	523	6.9	69	30	553	11.1	59
---	30	997	10.6	35	30	1,036	19.8	72	24	968			28	1,051	14.8	61	30	1,010	6.7	45	30	965	4.4	69	30	998	8.2	55
---	30	1,470	6.9	38	30	1,527	17.3	58	24	1,467			28	1,534	12.8	54	30	1,477	4.2	40	30	1,428	1.6	66	30	1,467	4.9	60
---	30	1,964	3.0	43	30	2,042	14.3	51	24	2,005			28	2,041	10.4	50	30	1,968	1.8	39	30	1,915	- 0.9	66	30	1,959	2.1	59
---	30	2,487	- 1.0	45	29	2,593	12.2	31	23	2,565	17.9	33	28	2,579	7.5	48	30	2,490	- 1.0	36	30	2,435	- 3.3	64	30	2,485	- 0.7	57
---	30	3,030	- 4.5	46	29	3,159	9.8	23	24	3,144	15.5	35	28	3,141	4.7	42	30	3,033	- 3.7	33	30	2,971	- 5.9	60	30	3,026	- 3.4	51
---	30	3,617	- 7.5	40	29	3,780	6.3		23	3,768	8.4	43	27	3,743	1.6	31	30	3,621	- 6.8	33	30	3,558	- 8.8	56	30	3,617	- 6.5	50
---	30	4,229	-11.4	37	29	4,422	2.3		23	4,420	3.1	49	26	4,385	- 2.2		30	4,234	-10.2	32	30	4,165	-12.1	53	30	4,230	-10.2	46
---	30	4,896	-15.4	35	29	5,119	- 1.9		22	5,124	- 2.2	48	26	5,067	- 6.7		30	4,903	-14.7	31	30	4,831	-15.9	50	30	4,899	-14.1	41
---	30	5,604	-20.2	35	26	5,871	- 6.5		22	5,870	- 7.3	45	26	5,808	-11.6		30	5,614	-19.7		29	5,529	-21.1	50	30	5,612	-19.1	38
---	30	6,379	-25.7	36	26	6,690	-12.1		21	6,696	-12.6		25	6,610	-17.3		29	6,390	-25.7	35	29	6,301	-26.8	48	30	6,390	-24.7	38
---	30	7,218	-32.3		26	7,577	-18.2		21	7,574	-18.8		24	7,483	-23.3		29	7,230	-32.0		29	7,139	-32.9	46	30	7,234	-31.0	36
---	29	8,143	-39.4		26	8,560	-25.6		18	8,555	-25.9		24	8,447	-30.3		29	8,159	-39.1		29	8,064	-39.6		30	8,166	-38.3	
---	28	9,178	-47.6		26	9,658	-34.0		17	9,652	-34.5		24	9,524	-38.8		29	9,196	-47.4		29	9,104	-46.6		29	9,206	-46.2	
---	26	10,358	-55.3		26	10,911	-43.4		14	10,901	-44.6		24	10,750	-48.1		28	10,374	-55.6		28	10,289	-52.7		29	10,396	-53.8	
---	25	11,761	-59.3		26	12,376	-54.4		9	12,347	-56.3		24	12,190	-57.2		27	11,782	-61.5		26	11,724	-55.0		29	11,810	-58.0	
---	25	12,598	-58.2		26	13,219	-60.3		6	13,168	-62.8		22	13,029	-59.7		27	12,609	-60.9		26	12,575	-55.4		28	12,651	-57.6	
---	24	13,577	-56.7		26	14,166	-66.4						22	13,987	-62.0		26	13,573	-59.1		22	13,543	-54.0		28	13,613	-57.1	
---	22	14,732	-57.2		26	15,255	-71.2						20	15,115	-64.2		26	14,715	-59.0		22	14,709	-54.7		22	14,749	-56.8	
---	20	16,145	-58.3		26	16,559	-75.2						16	16,465	-68.5		26	16,112	-59.6		21	16,136	-56.1		20	16,160	-57.9	
---	17	17,547	-58.0		25	17,843	-76.5						11	17,809	-70.4		23	17,506	-60.1		18	17,552	-56.6		13	17,566	-58.3	
---	13	19,354	-57.2		20	19,510	-70.2						8	19,525	-66.2		18	19,295	-58.9		16	19,373	-56.8		5	19,415	-59.0	
---	11	20,515	-57.9		18	20,601	-65.3						7	20,649	-62.3		12	20,450	-58.4		12	20,538	-57.0					
---	6	21,932	-54.3		14	21,974	-59.3						5	22,046	-58.5						7	21,963	-58.2					
---					5	23,840	-54.9																					

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200 G.C.T.. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

Altitude (meters) m.s.l.	Abilene, Tex. (531 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. ([illegible] m.)			Cincinnati, Ohio (273 m.)			El Pas (1,198 m		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	
Surface	30	211	1.4	30	259	3.1	28	258	3.7	29	3	2.1	30	320	2.4	29	309	2.5	30	132	5.8	27	219	3.3	27	251	1.4	29	213	4.2	28	244	3.3	29	254	4
500	--	--	----	--	--	----	28	245	3.9	--	---	----	--	---	----	--	---	----	30	141	5.6	27	224	4.4	27	245	3.1	29	211	4.9	28	251	4.0	--	---	--
1,000	30	246	3.3	--	-	----	27	245	4.2	--	---	----	30	326	3.5	29	305	2.5	23	147	4.0	22	244	5.6	26	254	5.2	29	236	5.3	24	237	5.7	--	---	--
1,500	30	232	3.4	--	--	----	25	250	4.9	29	326	1.7	27	324	2.5	29	300	3.2	21	180	1.6	18	261	6.2	21	262	6.3	29	255	6.6	20	237	7.3	29	252	4
2,000	29	217	5.7	30	259	4.7	25	249	6.6	26	296	2.7	24	283	2.0	29	304	3.6	17	197	2.3	15	275	6.6	10	279	6.9	27	263	8.5	18	245	8.6	29	249	5
2,500	28	255	8.2	30	259	4.7	21	263	9.9	23	287	5.5	20	284	3.7	28	304	3.8	15	221	3.7	12	299	5.3				26	269	11.3	16	258	10.9	29	256	7.
3,000	24	264	10.0	27	266	5.6	18	271	12.1	19	273	7.0	19	291	6.3	27	291	4.9	13	243	4.5	11	298	6.0				22	269	13.3	13	256	11.0	28	260	7
4,000	22	268	13.1	25	281	8.3	13	281	16.4	15	282	9.3	18	298	8.9	27	297	7.2										20	271	15.2	12	277	13.4	26	271	11.
5,000	19	274	16.4	19	281	11.8	10	285	17.4	12	296	7.4	14	298	10.3	25	304	9.7										15	278	14.3	10	273	14.3	25	272	15.
6,000	18	277	18.3	16	282	14.5							11	311	8.3	23	306	10.1										14	278	15.8				23	279	17.
8,000	13	280	22.5	10	269	14.9										18	300	13.1										10	276	17.0				21	281	20.
10,000																15	308	15.1																15	271	25.
12,000																																		11	272	30.

	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashvill Tenn (182 m.		
Surface	30	268	1.2	30	288	1.9	29	254	2.8	27	297	1.5	30	129	1.6	28	271	2.4	30	190	1.4	30	218	1.2	30	331	2.5	30	111	2.5	30	196	2.4	26	235	2
500	--	---	----	--	---	----	29	248	4.0	--	---	----	30	186	2.7	28	251	2.9	--	---	----	30	233	3.4	30	332	2.6	30	130	2.9	30	209	3.3	26	228	4
1,000	-	---	----	--	---	----	29	237	5.6	27	283	1.5	30	220	3.1	22	237	4.5	30	205	2.6	29	224	4.4	30	325	1.9	28	226	1.6	26	237	2.9	25	225	6
1,500	--	---	----	30	301	2.0	28	242	6.3	27	284	2.5	28	248	4.2	17	225	5.1	30	200	2.0	21	226	6.7	29	297	1.1	25	279	3.5	20	255	3.1	20	220	[illegible]
2,000	30	287	1.1	30	286	3.5	25	247	6.8	21	262	3.2	23	261	7.0	12	243	7.8	30	206	1.9	22	237	8.2	28	241	1.4	25	277	5.7	19	279	4.9	20	239	6
2,500	30	309	2.3	29	288	4.4	22	257	8.3	20	264	4.5	22	267	9.7	10	256	7.9	28	225	1.7	19	241	10.1	27	216	1.5	22	267	6.9	15	278	8.9	18	253	7
3,000	28	293	2.1	28	272	4.3	19	268	9.6	19	276	6.0	20	264	12.1				28	251	1.7	18	256	10.5	27	229	1.6	19	259	8.5	14	281	10.6	16	262	9
4,000	24	286	2.4	23	282	6.1	18	269	13.0	18	305	6.1	15	264	13.1				26	285	3.0	18	274	14.3	25	281	1.2	15	258	10.0	12	274	16.0	15	271	11
5,000	19	321	5.6	22	284	9.9	17	269	16.0	14	320	9.1	10	265	12.7				23	280	4.7	16	277	15.4	23	285	1.9	12	278	10.7				12	287	12
6,000	16	308	7.6	16	307	13.3	15	264	17.8	13	330	10.0							21	277	6.0	11	268	19.4	21	282	3.1							10	288	15
8,000							10	284	18.0										19	274	7.1				18	294	3.7									
10,000																			10	314	7.3				14	306	3.8									
12,000																									10	21	2.3									

	New York, N.Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash.		
Surface	29	238	2.1	29	258	4.0	29	306	2.7	27	329	3.4	30	231	0.9	30	345	4.1	26	291	2.3	27	212	1.5	30	149	2.3	28	257	4.2	22	313	1.5	30	300	2
500	29	241	4.6	27	268	3.5	28	316	2.7	27	323	4.4	30	228	1.4	--	---	----	26	303	2.4	27	219	2.6	30	162	2.4	28	262	3.0	22	316	2.0	30	302	2
1,000	29	258	5.5	22	250	1.3	28	304	2.4	19	291	4.1	30	214	2.7	30	346	4.4	24	351	1.9	24	240	4.2	30	177	2.8	22	224	2.0	21	13	.6	28	192	[illegible]
1,500	26	263	7.5	19	237	2.1	26	251	3.9	17	277	4.7	29	207	2.7	29	333	2.3	21	346	1.4	21	241	4.7	28	208	2.9	20	231	1.7	19	194	.7	27	162	1
2,000	21	271	9.5	19	245	2.3	24	250	7.4	13	283	9.4	29	218	3.3	27	332	1.1	17	312	3.6	18	244	6.3	25	244	4.9	20	200	1.2	16	263	2.8	26	203	1
2,500	16	277	12.2	17	243	1.6	24	252	9.1	13	280	11.2	27	227	4.1	23	294	3.1	16	301	4.5	16	250	8.9	23	265	7.0	19	229	1.8	13	275	5.7	25	264	1
3,000	12	293	15.8	17	282	1.1	24	270	10.8	11	294	13.5	26	233	4.4	19	299	5.6	15	296	6.4	14	258	9.8	23	269	10.0	19	218	2.7	11	286	4.0	24	293	3
4,000	10	297	19.1	18	232	.9	21	274	13.6				23	241	6.3	12	313	12.1	13	310	9.8	10	272	13.7	20	274	15.3	16	235	5.3	11	297	5.6	24	298	5
5,000				15	172	1.5	20	279	16.2				20	245	7.4				11	293	11.6				19	274	19.3	12	249	4.6				22	291	6
6,000				13	148	1.7	14	281	16.0				16	272	9.3				10	300	16.6				15	274	23.0	11	242	5.4				20	288	7
8,000							10	277	17.7																									18	294	8
10,000																																		15	312	9
12,000																																		10	296	10

	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
Surface	30	264	1.3	30	231	1.4
500	-	-	- --	30	213	1.1
1,000	30	270	2.7	29	241	5.8
1,500	30	266	3.0	28	250	7.3
2,000	29	263	2.7	23	258	8.8
2,500	28	285	3.5	21	259	10.5
3,000	25	307	4.7	20	267	11.9
4,000	23	313	8.3	16	274	15.5
5,000	20	309	10.0	15	282	17.5
6,000	19	312	12.3	11	286	16.9
8,000	14	316	15.0			
10,000	10	338	10.9			

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270); speeds in meters per second

RAWIN DATA

Average monthly resultant winds

le 22

APRIL 1951

ltitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.) No. of observations	Direction	Speed	Big Spring, Tex. (774 m.) No. of observations	Direction	Speed	Bismarck, N. Dak. (505 m.) No. of observations	Direction	Speed	Brownsville, Tex. (7 m.) No. of observations	Direction	Speed	Burrwood, La. (3 m.) No. of observations	Direction	Speed
ace	30	30	0.3	30	165	3.8	30	354	2.9	30	119	4.7	30	171	0.8
	--	---	----	--	---	----	--	---	----	30	138	7.1	30	172	2.7
0	-	---	----	30	168	5.7	30	349	4.4	30	143	4.4	30	197	3.0
0	--	---	----	30	202	5.8	30	342	3.9	30	179	1.3	30	228	3.2
0	30	290	3.5	30	236	6.2	30	319	4.0	30	260	2.4	30	252	4.2
0	30	283	5.8	30	253	8.5	29	323	5.1	30	376	3.8	30	259	6.0
0	30	285	6.9	27	261	9.7	29	313	5.5	30	273	6.2	30	262	8.7
0	30	275	8.9	23	270	11.0	28	302	7.2	29	270	12.6	28	266	13.0
0	30	269	11.0	20	274	14.4	25	300	8.7	29	270	15.3	27	267	16.6
0	29	283	12.9	19	279	16.4	22	299	9.7	29	274	18.5	24	276	17.1
0	21	271	17.1	14	282	22.9	23	281	13.6	22	281	22.1	22	274	23.7
00	17	272	23.2	11	279	28.4	17	266	9.2	13	283	25.6	17	287	22.9
00	12	277	26.9				13	305	8.4				10	280	26.7
00															
00															
00															

ltitude (meters) m.s.l.	Caribou, Me. (191 m.) No. of observations	Direction	Speed	Charleston, S.C. (13 m.) No. of observations	Direction	Speed	Columbia, Mo. (237 m.) No. of observations	Direction	Speed	Grand Junction, Colo. (1,473 m.) No. of observations	Direction	Speed
ace	30	270	0.9	30	202	2.3	29	266	1.0	30	5	1.1
	30	274	1.6	30	225	5.2	29	252	2.8	--	---	----
0	29	289	.7	29	241	6.2	29	249	4.6	--	---	----
0	29	291	1.3	29	255	6.8	28	266	7.3	30	360	.9
0	29	270	1.4	29	266	7.2	28	270	8.1	29	299	2.4
0	29	250	2.2	29	265	8.1	28	272	9.4	29	288	4.2
0	28	223	2.7	29	267	9.7	28	271	10.0	29	280	4.9
0	28	219	3.8	28	266	10.2	28	281	11.6	30	280	6.1
0	28	236	5.3	28	273	13.3	28	231	14.4	30	282	6.6
0	28	254	6.5	28	271	16.2	25	282	13.6	28	296	8.5
0	25	253	7.1	23	271	22.1	23	275	15.2	24	300	10.7
00	22	249	12.1	16	270	18.1	18	265	21.1	17	266	7.9
00	17	241	9.4	15	279	23.7	13	264	20.6	12	279	15.3
00	16	245	6.9	19	290	22.8	10	256	22.9	11	279	17.7
00	12	239	8.0									
00	11	260	6.2									

ltitude (meters) m.s.l.	Greensboro, N.C. (275 m.) No. of observations	Direction	Speed	Hatteras, N.C. (3 m.) No. of observations	Direction	Speed	International Falls, Minn. (358 m.) No. of observations	Direction	Speed
ace	30	236	0.7	29	228	1.5	29	351	1.3
	30	228	3.8	27	237	4.0	28	3	2.9
0	30	236	6.1	27	254	5.6	28	11	3.4
0	30	246	7.6	27	267	6.8	28	3	3.6
0	30	257	8.7	28	267	8.0	28	360	3.8
0	30	265	9.6	28	267	9.7	29	332	3.6
0	30	266	11.3	29	264	10.8	28	337	5.0
0	29	266	13.0	26	273	15.6	28	324	6.2
0	28	267	15.3	26	269	16.5	27	318	7.2
0	27	261	17.8	23	273	16.2	27	314	7.1
0	22	267	17.9	21	274	17.6	25	288	9.7
00	26	275	22.2	18	276	21.6	21	267	12.0
00	15	276	23.3	13	279	23.4	15	320	4.5
00	13	275	28.7				12	2	2.1
00							12	285	2.9
00									

	Little Rock, Ark. (80 m.) No. of observations	Direction	Speed	Medford, Oreg. (401 m.) No. of observations	Direction	Speed	Miami, Fla. (12 m.) No. of observations	Direction	Speed	Nantucket, Mass. (14 m.) No. of observations	Direction	Speed	Nashville, Tenn. (180 m.) No. of observations	Direction	Speed
S ace	30	270	0.5	30	323	2.6	30	98	1.4	30	246	1.5	30	221	1.5
5	30	223	2.5	30	326	2.8	30	121	2.9	29	269	5.7	29	230	3.9
1,0	30	238	5.1	30	321	4.1	30	173	1.1	29	272	6.4	28	238	6.3
1,0	29	249	7.2	30	318	3.0	30	248	2.5	29	269	8.0	28	251	8.9
2,0	27	259	7.9	30	299	1.6	30	244	3.9	29	262	9.8	29	258	10.0
2,0	27	274	9.2	30	276	1.5	30	245	5.6	29	264	11.1	28	262	10.0
3,0	27	278	10.5	30	274	1.7	30	249	6.8	28	264	12.3	28	263	11.4
4,0	26	281	14.3	29	286	2.5	29	256	7.4	27	267	16.1	26	267	12.5
5,0	26	279	16.4	28	287	2.8	29	263	10.3	24	276	16.8	25	266	13.6
6,0	25	277	18.8	27	278	4.3	29	260	13.3	23	277	17.4	24	271	16.8
8,0	18	282	18.8	26	310	4.9	24	278	14.8	17	288	22.2	24	272	19.5
10 00	15	287	21.5	21	305	9.5	24	275	22.4	12	264	18.5	17	278	21.7
12 00	12	281	28.4	11	325	7.7	18	283	27.8				12	267	25.0
14 00	11	270	30.5				12	293	28.3						
16 00															
18 00															
20 00															

	Oakland, Calif. (8 m.) No. of observations	Direction	Speed	Oklahoma City, Okla. (392 m.) No. of observations	Direction	Speed	Rapid City, S. Dak. (980 m.) No. of observations	Direction	Speed	San Antonio, Tex. (242 m.) No. of observations	Direction	Speed
S ace	30	276	3.8	29	87	1.9	30	4	3.0	30	116	3.3
5	30	275	4.9	23	30	3.2	-	---	--	30	131	4.6
1,0	30	271	3.0	23	346	2.7	30	2	3.2	30	161	4.0
1,0	30	271	1.7	23	288	4.6	30	348	3.4	30	204	3.9
2,0	28	306	1.4	26	277	7.8	29	311	3.9	30	243	5.2
2,0	28	345	.9	27	276	9.5	29	315	5.3	29	259	6.9
3,0	28	7	1.5	26	277	10.5	27	308	7.9	29	269	9.3
4,0	30	44	1.1	25	275	12.6	27	299	9.8	28	279	12.8
5,0	30	138	1.1	24	277	15.6	25	296	10.5	26	275	14.4
6,0	30	151	1.3	25	276	17.9	23	295	11.8	23	266	16.3
8,0	24	276	2.9	25	271	20.3	21	286	15.3	17	261	19.8
10 00	22	275	3.1	20	280	25.8	16	279	15.0	11	264	25.2
12 00	14	297	7.2	17	276	29.9	12	272	15.8			
14 00				11	258	27.9	10	284	11.3			
16 00												
18 00												
20 00												

	San Juan, P.R. (28 m.) No. of observations	Direction	Speed	St. Cloud, Minn. (318 m.) No. of observations	Direction	Speed	Santa Maria, Calif. (72 m.) No. of observations	Direction	Speed
S ace	30	131	4.0	30	323	2.3	30	279	3.3
5	30	102	7.3	29	327	4.1	30	286	2.5
1,0	30	106	6.4	29	354	4.6	30	303	2.1
1,0	30	107	5.9	29	350	3.5	30	337	1.2
2,0	30	110	5.1	28	338	1.7	30	22	1.3
2,0	30	104	4.3	29	343	5.8	30	34	1.1
3,0	30	104	3.6	30	328	6.3	30	326	.6
4,0	30	129	1.7	28	320	8.1	30	246	1.2
5,0	30	225	2.2	27	320	7.4	30	220	1.9
6,0	29	260	5.5	26	309	8.4	29	255	3.6
8,0	28	266	11.6	22	295	8.1	26	260	5.2
10 00	26	265	17.6	25	270	9.4	26	241	10.5
12 00	23	255	24.1	18	270	12.4	25	255	13.1
14 00	13	266	24.1	11	278	12.5	24	257	13.5
16 00							23	268	11.0
18 00							18	269	8.9
20 00							12	276	6.7

	Sault Ste. Marie, Mich. (221 m.) No. of observations	Direction	Speed	Spokane, Wash. (726 m.) No. of observations	Direction	Speed	Tatoosh Island, Wash. (33 m.) No. of observations	Direction	Speed
Su ace	30	326	0.8	30	262	0.7	30	208	0.7
50	30	354	.6	--	---	----	30	317	1.9
1,	28	317	1.8	29	296	1.6	30	347	1.3
1,	26	296	3.0	29	306	3.0	30	355	.4
2,	25	305	3.5	29	302	3.7	30	300	1.3
2,	25	296	4.4	23	298	4.9	30	291	2.8
3,	25	292	5.1	28	298	6.1	30	296	4.0
4,	23	299	6.6	28	302	7.5	29	298	5.6
5,	21	299	6.8	27	298	10.3	29	290	7.0
6,	19	315	8.9	26	300	10.6	26	279	7.2
8,	16	301	9.6	19	274	7.8	25	291	6.6
10 00				14	294	8.2	25	287	11.3
12 00				11	300	9.7	19	286	11.0
14 00							16	293	1.6
16 00							13	291	6.7
18 00							12	306	6.5

se free air resultant winds are based on rawin observations made near 0300 G T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

N : Resultants prepared from rawins at high altitudes are biased toward l r wind speeds. Values appearing in this table should therefore be used w caution when the number of observations missing is greater than three. See note following table 3 in the January 1951 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30--Solar radiation intensities, tabulated in langleys per minute.

TABLE MOUNTAIN, CALIF.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, EST 7:30 a.m.	Vapor pressure, EST 1:30 p.m.
Air mass	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
April										Mb.	Mb.
1----	1.15	1.25	1.34	1.48	----	----	----	----	----		
9----	----	----	----	1.42	----	----	----	----	----		
13----	----	----	----	1.45	----	----	----	----	----		
Averages	1.15	1.25	1.34	1.45	----	----	----	----	----		
Departures	+.09	+.09	+.07	+.03	----	----	----	----	----		

LINCOLN, NEBR.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, EST 7:30 a.m.	Vapor pressure, EST 1:30 p.m.
Air mass	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
April										Mb.	Mb.
3----	----	----	----	1.22	1.40	----	----	----	----	3.8	4.2
13----	----	----	----	1.14	1.38	----	----	----	----	5.3	5.6
16----	----	----	----	----	1.42	1.21	1.16	1.07	1.01	3.2	2.2
18----	----	----	----	1.01	1.30	----	----	----	----	5.8	5.1
Averages	----	----	----	1.12	1.37	1.24	1.16	1.07	1.01	----	----
Departures	----	----	----	-.06	-.07	+.08	+.20	+.23	+.30	----	----

MADISON, WIS.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, EST 7:30 a.m.	Vapor pressure, EST 1:30 p.m.
Air mass	4.81	3.81	2.83	1.92	*0.96	1.92	2.88	3.84	4.81		
April										Mb.	Mb.
3----	0.68	0.81	0.92	1.13	1.32	----	----	----	----	4.9	6.1
5----	.95	1.06	1.14	1.33	1.41	----	----	----	----	4.6	5.3
9----	.52	.63	.79	.99	1.31	----	----	----	----	5.3	5.8
11----	----	----	.90	1.11	----	----	----	----	----	6.6	6.9
17----	.76	.87	.99	1.15	1.43	----	----	----	----	4.4	4.4
19----	.77	.92	1.02	1.18	1.38	----	----	----	----	4.8	4.1
23----	.70	.87	.95	1.11	1.34	----	----	----	----	5.1	[illegible]
26----	----	----	.70	1.01	1.45	----	----	----	----	5.6	[illegible]
Averages	.73	.86	.93	1.13	1.38	----	----	----	----	----	----
Departures	+.04	+.02	-.06	-.04	-.02	----	----	----	----	----	----

BOSTON, MASS.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, EST 7:30 a.m.	Vapor pressure, EST 1:30 p.m.
Air mass	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
April										Mb.	Mb.
16----	----	----	----	1.09	----	----	----	----	----	5.6	5.3
17----	----	----	----	1.15	----	----	----	----	----	5.1	4.4
Averages	----	----	----	1.12	----	----	----	----	----	----	----
Departures	----	----	----	+.01	----	----	----	----	----	----	----

TACUBAYA, D. F., MEXICO

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, EST 7.30 a.m.
Air mass	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83	
April										Mb.
2----	0.51	----	----	1.01	----	0.72	0.40	0.24	0.14	5.7
4----	.19	----	----	.67	----	----	----	----	.30	9.3
5----	.55	----	----	.60	----	----	----	----	----	8.8
6----	.59	----	----	.75	----	.95	.85	.69	.45	7.7
7----	.47	----	----	.92	----	.63	.49	.45	.23	7.4
9----	.82	0.90	----	----	----	.63	----	----	----	3.9
10----	.46	.53	----	.82	----	----	----	----	----	6.4
11----	.41	.50	----	.69	----	----	----	----	----	5.7
12----	.21	.24	----	.65	----	----	.69	.38	.31	8.4
14----	.24	.41	----	.73	----	----	----	----	.20	6.9
18----	.16	.20	----	.59	----	----	----	----	----	6.4
19----	.27	.26	----	.66	----	----	----	----	----	6.8
23----	.17	.20	----	.49	----	----	----	----	----	10.7
24----	.31	.41	----	.73	----	----	----	----	----	9.4
25----	.29	.35	----	.65	----	----	----	----	----	8.9
26----	.37	.53	----	.79	----	----	----	----	----	10.3
27----	.35	.47	----	.90	----	----	----	----	----	9.1
28----	.26	.34	----	.66	----	----	----	----	----	9.3
Averages	.37	.41	----	.72	----	.73	.61	.44	.27	----
Departures	.00	-.03	----	-.05	----	----	----	-.02	.03	----

BLUE HILL, MASS.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, EST 7.30 a.m.
Air mass	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86	
April										Mb.
1----	----	----	0.90	1.08	----	0.97	----	----	----	5.8
5----	----	----	.81	.98	----	----	----	----	----	5.7
6----	0.53	0.65	.77	----	----	----	----	----	----	5.7
7----	----	----	----	1.21	----	----	----	0.76	----	6.1
8----	----	----	----	----	----	----	0.80	.69	0.58	9.3
10----	----	----	----	.81	----	----	----	----	----	10.5
13----	----	----	----	----	----	----	.81	.75	.61	11.0
15----	.61	.71	.85	----	----	----	----	----	----	6.8
16----	.65	.76	.90	1.03	----	----	----	----	----	4.6
17----	----	----	1.02	1.18	----	----	----	----	----	5.0
18----	.63	.73	.88	1.05	----	----	----	----	----	5.0
19----	----	----	----	----	----	----	.76	.56	.42	7.6
20----	----	----	----	----	----	1.23	1.05	.93	.83	5.1
21----	.71	.82	.97	1.14	----	----	----	----	----	4.4
23----	----	----	----	----	1.48	1.22	1.07	.93	.83	13.2
24----	----	----	----	1.19	----	----	----	----	----	4.7
27----	----	----	----	1.30	1.46	1.09	.91	.79	.67	6.4
28----	----	----	.91	1.07	----	----	----	----	----	7.2
30----	.75	.87	1.00	1.18	1.49	----	----	----	----	6.9
Averages	.65	.76	.90	1.10	1.48	1.13	.90	.77	.66	----
Departures	.13	-.12	-.12	-.08	+.08	.00	-.05	-.05	-.03	----
RATIO BOSTON/BLUE HILL ON COMPARABLE DATES										
	----	----	----	1.01	----	----	----	----	----	

ALBUQUERQUE, N.M.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, EST 7.30 a.m.
Air mass	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08	
April										Mb.
1----	----	----	----	----	----	1.38	1.19	1.07	0.96	2.7
2----	0.96	1.10	----	1.12	1.58	----	----	----	1.00	2.6
[illegible]	.94	1.06	1.18	1.36	1.54	----	----	----	----	2.4
[illegible]	----	----	----	1.38	----	----	----	----	----	4.0
[illegible]	----	----	----	----	----	1.40	1.27	1.18	1.12	1.4
[illegible]	.89	1.02	1.16	1.34	----	1.32	1.21	----	1.00	4.4
[illegible]	.92	1.05	1.20	1.38	----	1.27	----	----	----	4.4
10----	.91	1.07	1.21	1.39	1.52	----	----	----	----	2.9
11----	1.00	1.11	1.24	1.41	1.56	1.17	.89	.75	.60	1.9
12----	.98	1.09	1.25	1.41	1.62	1.40	1.16	1.02	.86	1.4
13----	1.01	1.10	1.25	1.43	1.65	1.45	1.34	1.22	1.14	1.6
14----	1.05	1.17	1.28	1.47	1.67	----	----	----	----	1.1
15----	.76	----	----	----	----	----	----	----	----	2.9
16----	.44	.61	.80	1.05	1.35	----	----	----	----	2.5
18----	----	----	----	1.27	----	----	----	----	----	3.5
[illegible]	----	1.00	1.13	----	----	----	----	----	----	3.8
21----	1.01	1.10	1.21	1.36	1.55	1.40	1.25	1.12	1.02	5.6
22----	.92	[illegible]	1.17	1.29	----	1.31	1.05	.89	.75	4.8
[illegible]	----	----	----	1.26	[illegible]	----	----	----	----	5.0
24----	----	----	----	----	----	.76	.95	.80	.78	3.3
[illegible]	1.02	1.12	1.25	[illegible]	[illegible]	----	----	----	----	2.7
[illegible]	----	----	----	1.30	----	----	----	----	----	1.9
[illegible]	1.07	1.16	[illegible]	1.40	[illegible]	1.42	1.24	1.12	1.02	2.4
Averages	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.30	1.16	1.02	.95	----
Departures	+.02	[illegible]	[illegible]	[illegible]	[illegible]	.00	+.01	-.04	.01	----

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

le 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

e	2	3	4	5	6	7	8	Aver-age	9	10	11	12	13	14	15	Aver-age	16	17	18	19	20	21	22	Aver-age
gleys	80	67	204	232	381	374	180	217	101	252	111	314	251	174	247	207	214	269	336	163	378	342	293	285
e	23	24	25	26	27	28	29	Aver-age																
gleys	236	116	98	306	350	279	199	269																

able 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

e	2	3	4	5	6	7	8	Aver-age	9	10	11	12	13	14	15	Aver-age	16	17	18	19	20	21	22	Aver-age
gleys	66	57	102	81	104	100	75	84	75	82	63	96	99	93	113	89	98	111	126	104	103	107	130	111
e	23	24	25	26	27	28	29	Aver-age																
gleys	80	110	60	111	107	121	116	101																

le 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

e	2	3	4	5	6	7	8	Aver-age	9	10	11	12	13	14	15	Aver-age	16	17	18	19	20	21	22	Aver-age
gleys	104	78	186	154	202	117	111	136	129	127	96	166	161	175	189	149	150	158	203	190	116	155	258	176
e	23	24	25	26	27	28	29	Aver-age																
gleys	85	142	98	158	91	191	220	141																

te.—Langley is the unit used to denote one gram calorie per square centimeter

SOLAR RADIATION DATA

Table 33.--Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. **APRIL 1951**

1951	Aklavik, Mackenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Bethel, Alaska	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Is., Pac.Area	Caribou, Me.
April 2------	176	624		228	166	359	117	548	87	618	(668)	284
April 3------	257	653		653	574	327	92	556	115	476	630	39
April 4------	325	410		663	663	331	325	539	281	576	682	228
April 5------	326	395		618	610	199	342	557	289	548	708	424
April 6------	200	356		55	193	389	525	578	494	451	668	306
April 7------	314	487		169	68	427	531	588	452	459	678	165
April 8------	351	622		(505)	648	353	266	496	270	557	685	352
Averages------	278	507		(413)	417	341	314	552	284	526	(674)	257
Departures----	-32	-36		-65	---	+5	-63	+17	-39	---	---	-28
April 9------	288	676		507	637	412	159	576	134	680	445	148
April 10------	343	654		476	675	338	343	617	364	603	615	197
April 11------	494	726		(587)	511	336	(161)	616	116	255	685	171
April 12------	507	717		587	---	466	505	621	541	226	688	345
April 13------	511	729		685	---	223	406	610	359	664	576	95
April 14------	344	660		688	699	261	301	610	266	713	641	162
April 15------	247	649		699	694	154	437	637	394	497	646	316
Averages------	391	687		(604)	643	313	(330)	612	311	(520)	614	205
Departures----	+31	+66		+94	---	-43	-41	+16	-30	---	---	-35
April 16------	525	673		72	538	(387)	403	598	334	192	664	200
April 17------	487	570		692	730	235	527	581	427	401	(696)	343
April 18------	285	714		593	679	483	584	628	444	576	670	306
April 19------	254	490		(157)	---	385	312	647	293	711	(668)	117
April 20------	316	315		527	658	555	695	624	639	473	601	217
April 21------	278	724		556	---	561	617	670	588	379	(662)	311
April 22------	520	729		344	---	577	471	516	423	670	(616)	546
Averages------	381	602		(420)	651	(455)	516	609	450	486	---	291
Departures----	-14	-28		-106	---	+64	+113	+52	+59	---	---	+7
April 23------	603	676		517	735	583	466	506	439	545	(504)	163
April 24------	448	702		681	---	520	642	643	585	407	(345)	540
April 25------	371	587		697	635	245	123	453	109	(466)	(627)	502
April 26------	342	723		703	684	355	469	497	452	624	407	120
April 27------	540	759		685	---	199	712	441	659	544	594	485
April 28------	385	531		711	---	280	549	88	506	522	(263)	493
April 29------	296	409		630	---	195	379	164	381	(514)	(553)	126
Averages------	426	627		661	---	339	477	399	447	(517)	---	347
Departures----	+7	-20		+67	---	-77	+32	-85	+63	---	---	-36
Accumulated Departures January 1 to April 29, 1951	-273	-189		-63	---	-413	+3262	-133	-1449	---	---	---

1951	Charleston, S.C.	Cleveland, Ohio	Columbus, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.
April 2------	460	220	228	383	104	230	300	676	640	277	695
April 3------	636	142	188	280	60	154	385	673	582	335	671
April 4------	647	206	217	508	164	505	476	545	414	417	654
April 5------	652	627	592	430	506	264	503	700	507	382	501
April 6------	335	495	405	493	331	509	528	507	676	294	511
April 7------	106	407	421	450	277	368	382	715	531	432	648
April 8------	510	108	208	613	28	337	363	735	604	426	569
Averages------	478	315	323	451	210	338	420	650	565	367	607
Departures----	---	---	---	-28	-82	-26	+12	-16	---	+36	+11
April 9------	677	207	361	590	359	(177)	395	744	630	418	656
April 10------	548	170	167	597	356	(546)	449	(625)	638	378	663
April 11------	640	403	241	609	332	(426)	304	774	706	326	703
April 12------	462	186	323	575	244	530	482	782	703	482	731
April 13------	696	223	135	536	88	502	278	779	703	416	739
April 14------	697	---	316	591	131	450	440	(723)	481	383	706
April 15------	695	328	559	574	132	409	575	741	665	445	605
Averages------	631	253	300	582	234	434	418	(738)	647	407	686
Departures----	---	---	---	+25	-90	+37	-4	+29	---	+41	+43
April 16------	(286)	248	250	447	198	368	298	745	496	252	713
April 17------	693	163	320	366	223	370	214	728	494	277	675
April 18------	673	553	614	581	89	475	200	765	580	449	604
April 19------	268	211	574	471	336	294	435	544	484	517	525
April 20------	518	690	642	683	575	615	638	(647)	588	478	296
April 21------	701	545	465	630	363	565	644	782	690	409	710
April 22------	402	108	118	541	79	425	605	756	456	468	612
Averages------	(506)	360	426	531	266	444	433	(710)	541	407	591
Departures----	---	---	---	-37	-104	+30	-5	-3	---	+18	-9
April 23------	266	723	688	607	566	322	546	664	522	555	707
April 24------	291	333	531	210	61	613	465	755	476	557	706
April 25------	610	367	489	440	94	243	540	718	359	268	226
April 26------	697	331	340	639	532	377	578	(705)	411	447	474
April 27------	571	595	625	458	543	655	430	778	707	528	(621)
April 28------	452	400	416	466	416	561	455	533	234	376	545
April 29------	541	502	568	517	419	303	270	(699)	423	418	436
Averages------	490	464	522	477	376	439	469	(693)	447	450	(531)
Departures----	---	---	---	-76	+17	-5	-6	-16	---	+59	+15
Accumulated Departures January 1 to April 29, 1951	---	---	---	-1778	-5117	-2345	-21	---	---	+2261	---

1951	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Inyokern, Calif.	Ithaca, N.Y.	Keflavik, Iceland
April 2------	448	197	576	668	313	155		452	577	144	143
April 3------	231	679	562	670	422	665		689	276	163	292
April 4------	584	639	561	377	414	689		681	580	146	79
April 5------	505	634	421	409	589	655		690	538	122	185
April 6------	612	87	405	445	484	175		695	625	599	(257)
April 7------	609	96	621	409	400	62		688	670	619	327
April 8------	608	246	524	263	182	674		432	700	522	275
Averages------	514	368	524	463	401	439		618	567	331	(223)
Departures----	+10	-68	+7	-18	---	-65		+57	-41	+39	---
April 9------	602	615	504	178	442	658		350	705	220	---
April 10------	616	380	380	395	589	698		371	699	149	---
April 11------	588	487	571	368	539	585		538	736	51	---
April 12------	598	422	625	499	380	751		622	733	141	---
April 13------	601	581	394	709	528	580		617	730	406	---
April 14------	629	---	341	(592)	594	725		677	662	120	323
April 15------	524	---	618	---	500	724		600	639	428	360
Averages------	594	497	490	(457)	510	674		539	701	216	---
Departures----	+38	-14	+2	-3	---	+102		-14	+58	-97	---
April 16------	576	154	554	724	254	380		580	599	174	215
April 17------	554	586	322	(675)	658	759		565	554	232	305
April 18------	524	579	172	322	631	658		294	524	472	213
April 19------	242	529	453	351	231	166		718	366	592	459
April 20------	611	518	512	401	606	682		690	705	575	206
April 21------	665	---	482	381	485	487		679	740	634	298
April 22------	631	---	644	442	119	371		605	742	121	252
Averages------	543	473	449	(464)	426	500		590	604	400	278
Departures----	-46	-73	-51	-5	---	-73		-15	-38	+76	---
April 23------	578	286	677	563	623	740		427	720	604	375
April 24------	586	646	685	(355)	652	429		704	738	416	---
April 25------	364	569	684	678	529	650		673	419	153	493
April 26------	550	635	625	324	492	677		580	704	245	269
April 27------	669	603	655	588	613	503		603	764	697	271
April 28------	140	---	565	516	225	649		357	455	112	259
April 29------	450	---	390	416	555	676		675	813	445	183
Averages------	477	546	612	(492)	527	618		574	659	381	308
Departures----	-103	-3	+82	-22	---	+48		+16	-5	-15	---
Accumulated Departures January 1 to April 29, 1951	+2177	+1617	---	-350	---	---		-182	+49	-2156	---

Table 33.--Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

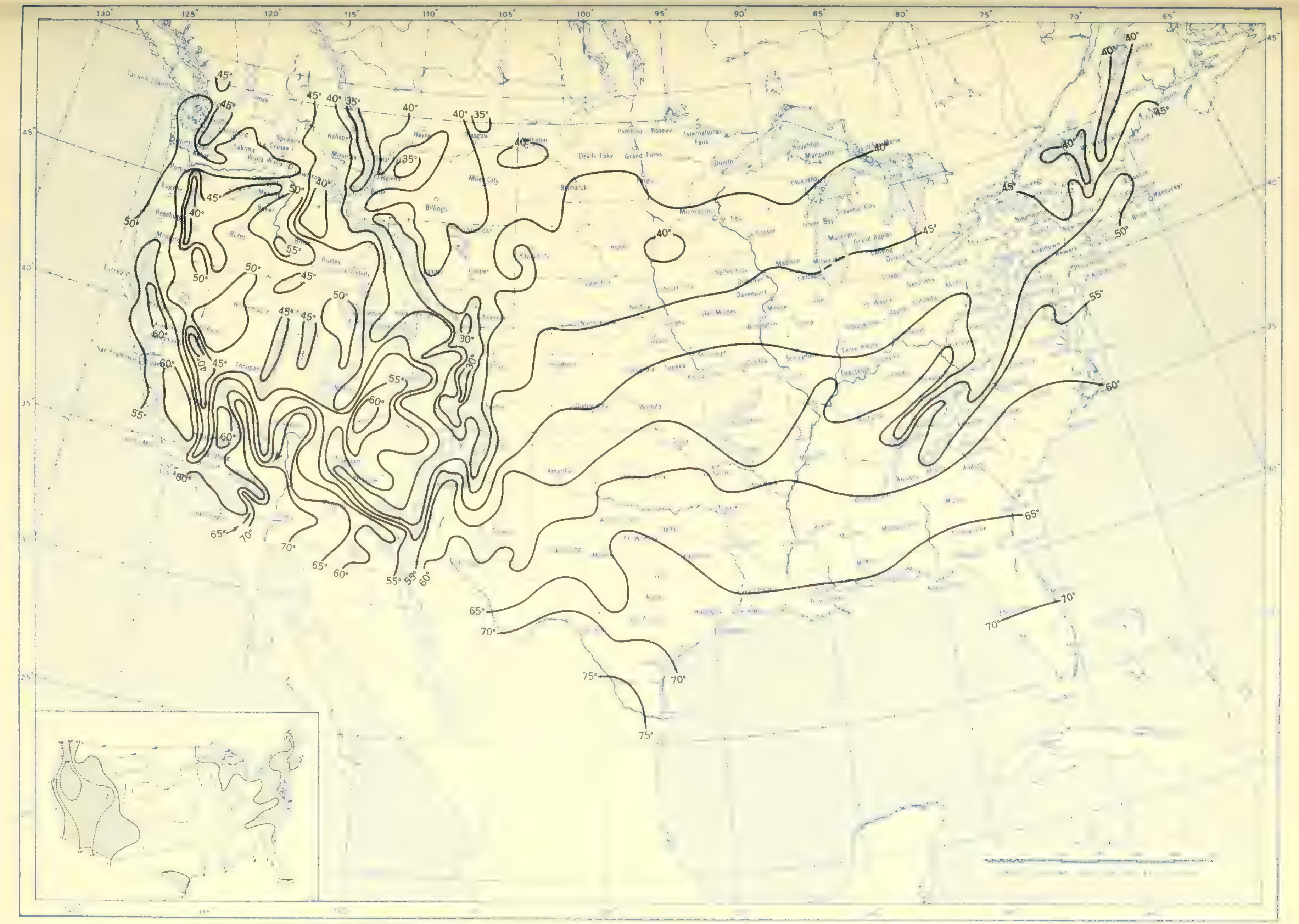
1951	Lake Charles, La.	Las Vegas, Nev.	Lincoln, Nebr.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Miami, Fla.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ontario	Pearl Harbor, T.H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S.D.
April 2	674	554	350	76	152	602	690	60	228	141	510	120	154	694	619	459	573
April 3	625	428	551	173	519	606	555	207	210	218	403	171	198	601	639	223	583
April 4	659	498	591	271	562	554	681	598	560	286	462	433	191	654	257	342	420
April 5	109	459	28	331	589	594	665	428	352	257	496	625	302	679	504	650	367
April 6	132	619	67	473	87	591	496	391	550	555	498	166	618	655	442	519	407
April 7	603	628	272	387	80	603	385	55	446	571	398	73	636	659	614	424	---
April 8	660	637	62	328	250	631	218	534	281	441	---	517	467	494	682	91	628
Averages	495	546	275	291	320	597	527	325	375	353	461	301	367	634	537	387	496
Departures	+24	-19	-115	-9	-51	+24	---	-83	-21	+5	+79	-24	+49	+70	-38	+23	+16
April 9	441	633	80	129	571	614	415	239	377	376	---	194	247	334	678	362	---
April 10	650	428	226	346	151	653	99	548	545	290	---	530	110	351	(576)	360	457
April 11	326	680	181	111	188	671	489	65	422	425	---	369	158	454	721	418	---
April 12	708	682	138	495	142	648	346	334	563	331	---	353	205	614	716	398	674
April 13	683	679	629	298	173	633	145	123	591	515	---	70	348	652	713	238	639
April 14	687	713	432	206	352	606	635	664	505	280	---	625	202	730	689	241	---
April 15	217	539	611	347	142	590	771	300	419	305	---	196	178	634	580	320	---
Averages	530	622	328	276	246	631	414	325	489	360	---	334	207	538	(667)	334	---
Departures	+35	+37	-80	-58	-156	+18	---	-59	+77	+6	---	-27	-80	+23	+50	-38	---
April 16	653	534	671	292	243	282	742	555	330	115	---	567	328	662	692	298	672
April 17	656	564	599	543	567	656	(618)	673	495	409	---	713	303	592	657	382	---
April 18	163	546	650	551	220	611	358	599	536	518	---	597	334	445	597	457	363
April 19	211	299	528	325	655	660	341	327	291	211	---	127	94	634	410	418	537
April 20	377	562	62	631	510	680	537	678	651	646	---	641	678	652	478	662	403
April 21	265	668	47	591	92	583	635	213	659	602	---	507	705	673	638	506	---
April 22	(659)	669	718	507	447	677	605	183	470	251	---	157	120	687	695	224	698
Averages	(426)	549	468	491	391	593	(548)	461	490	393	---	473	366	621	595	421	535
Departures	-43	-13	+22	+62	-16	+21	---	+5	+65	+5	---	+25	+34	+59	-10	-7	+24
April 23	693	610	560	422	538	583	755	737	438	669	---	714	417	428	658	707	---
April 24	562	655	224	563	134	541	680	693	648	534	---	671	---	685	718	222	270
April 25	465	242	111	91	129	611	619	587	322	295	---	381	---	664	332	309	---
April 26	230	666	316	454	664	572	702	277	360	342	---	333	---	554	697	496	397
April 27	443	704	565	706	422	105	750	519	691	589	---	517	---	552	475	681	---
April 28	577	278	585	487	430	(394)	754	586	662	432	---	454	---	408	688	367	688
April 29	479	545	292	490	513	494	664	601	324	517	---	503	---	582	360	466	---
Averages	493	529	379	459	404	(472)	704	572	492	482	---	510	---	553	561	464	---
Departures	+14	-52	-46	+12	-30	-16	---	+122	+30	+41	---	+25	---	+30	-50	+42	---
Accumulated Departures January 1 to April 29, 1951	+154	-539	-1414	-287	-3416	+448	---	-441	-1351	+427	---	-661	---	+1127	---	---	+553

1951	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	Santa Maria, Calif.	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle, Wash. (U. of W.)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Toronto, Ontario	Upton, N.Y.	Wake Is., Pac. Area	Washington, D.C.	Winnipeg, Manitoba
April 2	522	---	556	519	132	199	81	492	514	240	546	178	(150)	632	104	503
April 3	236	---	560	188	260	65	356	511	570	239	621	211	251	668	338	541
April 4	324	---	498	612	374	395	342	460	561	181	446	247	205	697	250	544
April 5	178	598	530	305	329	207	250	410	551	440	101	567	407	688	(434)	469
April 6	189	328	539	250	590	529	610	506	565	563	206	476	570	684	629	519
April 7	396	84	581	302	628	555	589	269	587	527	603	529	603	705	569	566
April 8	477	88	---	516	291	321	415	292	237	294	605	452	375	665	136	161
Averages	332	274	544	385	372	324	377	420	512	355	447	380	(366)	677	(352)	472
Departures	-121	-3	+85	-70	-25	---	-16	---	+1	-10	---	+51	-23	---	-24	+51
April 9	467	143	502	575	455	448	519	556	489	142	639	146	429	690	345	193
April 10	400	89	595	486	362	350	208	558	613	218	465	141	412	616	(193)	282
April 11	584	190	625	436	428	134	532	570	593	461	564	256	347	618	619	272
April 12	588	161	616	519	449	272	268	558	609	63	503	21	462	497	134	410
April 13	613	494	620	521	648	309	576	61	614	201	619	203	640	698	420	538
April 14	502	359	567	345	386	226	363	607	614	71	397	180	268	640	266	239
April 15	377	229	648	355	388	220	577	633	628	481	---	274	428	727	530	337
Averages	504	238	596	463	445	280	435	506	594	234	531	174	427	641	(358)	324
Departures	+19	-58	+74	+16	+20	---	+12	---	+21	-142	---	-167	+7	---	-40	-62
April 16	348	421	634	442	169	239	88	537	543	266	652	216	235	690	115	671
April 17	499	570	329	401	425	400	408	309	578	340	626	163	(567)	447	487	440
April 18	348	469	313	376	554	268	610	287	454	551	464	295	520	442	636	464
April 19	333	656	348	544	249	458	376	520	680	439	445	151	248	647	296	269
April 20	333	249	306	348	670	606	692	627	(675)	646	92	623	660	630	694	261
April 21	601	76	558	552	641	585	638	580	669	571	429	484	612	674	611	214
April 22	622	594	553	673	342	227	306	515	544	88	478	35	375	659	164	632
Averages	441	433	434	477	436	398	446	482	(592)	414	455	281	(460)	598	429	422
Departures	-63	+29	-56	+6	-30	---	-29	---	+20	+16	---	-90	+57	---	+8	+14
April 23	386	661	407	410	623	555	712	608	657	657	627	519	569	689	687	419
April 24	530	530	291	535	659	378	669	621	675	564	491	129	641	693	627	622
April 25	171	635	384	311	323	118	561	524	669	310	438	78	357	673	549	545
April 26	197	585	346	461	424	463	432	591	629	413	548	469	(440)	596	318	605
April 27	646	174	471	673	707	558	690	148	330	669	448	604	(621)	615	671	64
April 28	219	455	280	179	647	376	409	380	290	373	609	290	611	451	426	324
April 29	558	549	158	684	451	296	524	397	321	397	248	292	453	422	453	656
Averages	387	513	334	465	548	392	571	467	510	483	487	340	(527)	591	533	462
Departures	-80	+94	-68	-67	+103	---	+99	---	00	+62	---	-42	+90	---	+84	+56
Accumulated Departures January 1 to April 29, 1951	-679	+105	+350	-707	+294	---	+224	---	+392	-1358	---	-2800	+847	---	+735	+224

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Beginning with this issue, a new station, Miami, Florida, is being added to Table 33 and will appear regularly in future editions. The station is under the supervision of the U. S. Weather Bureau and is located at the Miami Airport. Coordinates are: latitude 25° 49' N; longitude 80° 17' W; elevation 13 meters, M.S.L. The pyrheliometer is located on the south-east corner of the observatory which is an 8-foot high structure on the roof of the building housing the Weather Bureau Offices. Exposure is excellent and occasional smoke from fires in the Everglades to the west, during the winter, is the only local cause of atmospheric pollution.

W.B.T.U., New Orleans, Louisiana --- 8/17/51 --- 2200



Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), April 1951.

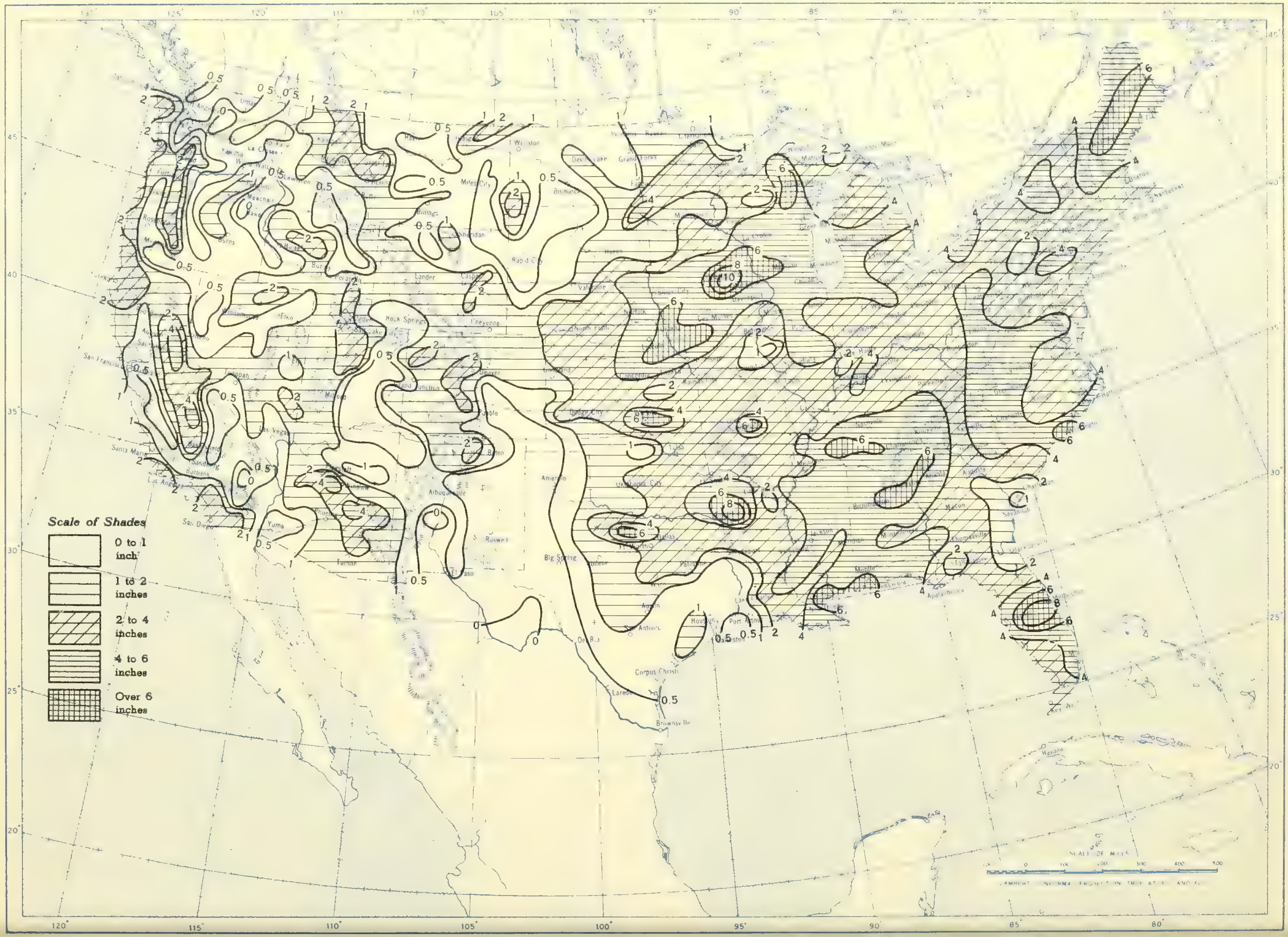
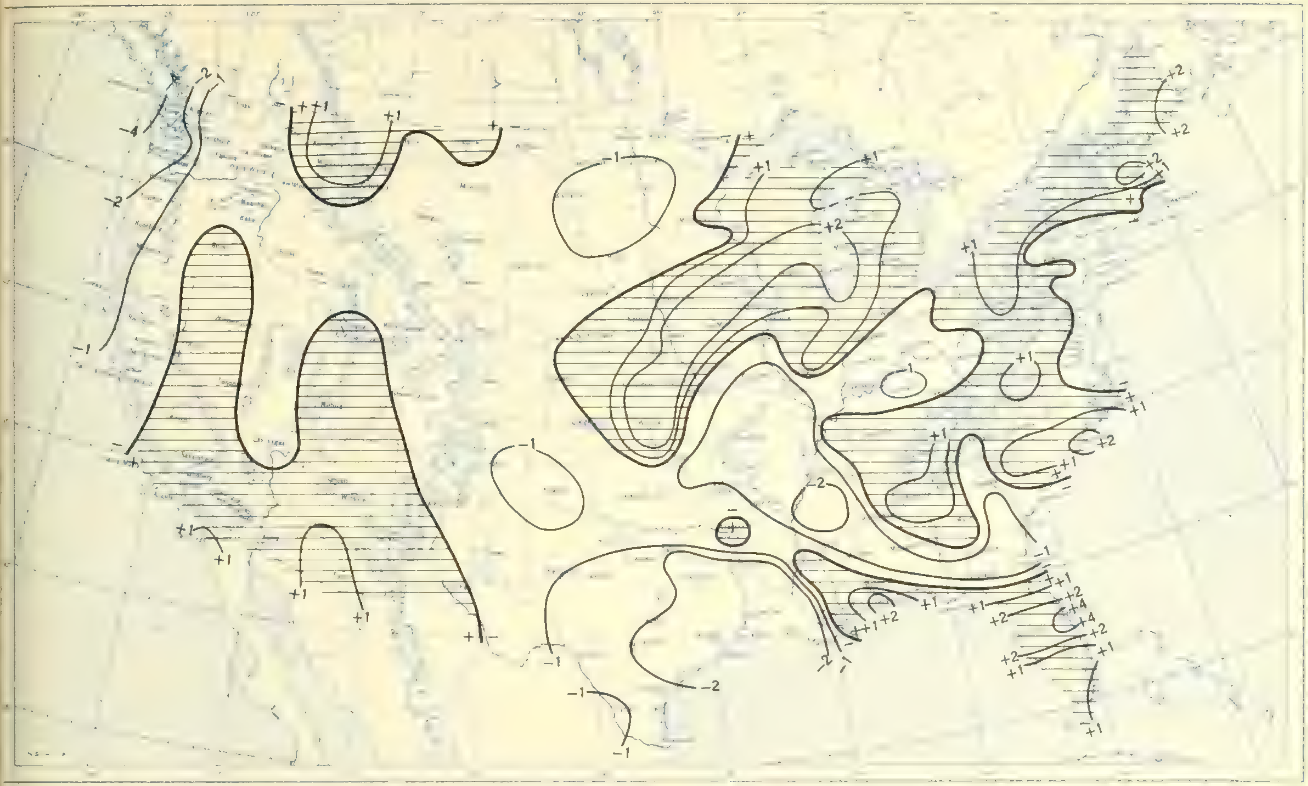
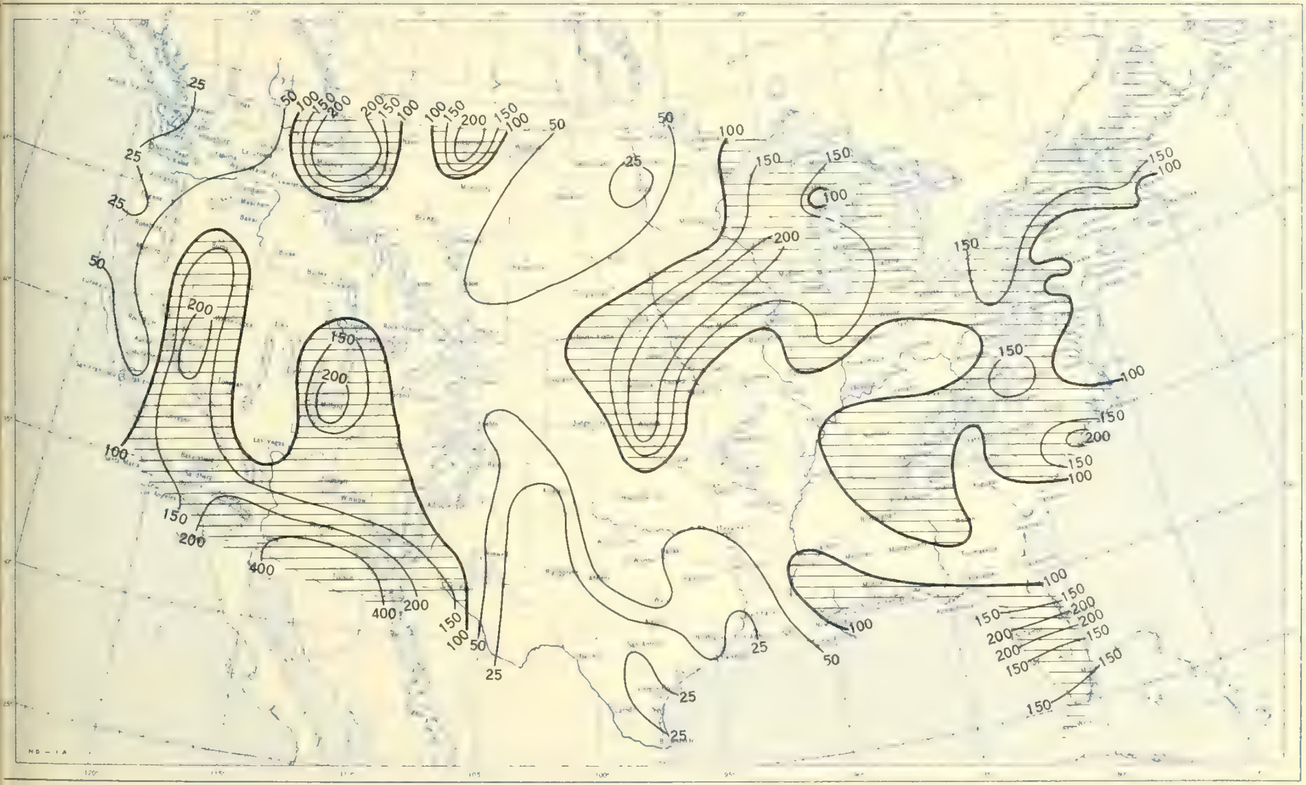


Chart III. A. Departure of Precipitation from Normal (Inches), April 1951.

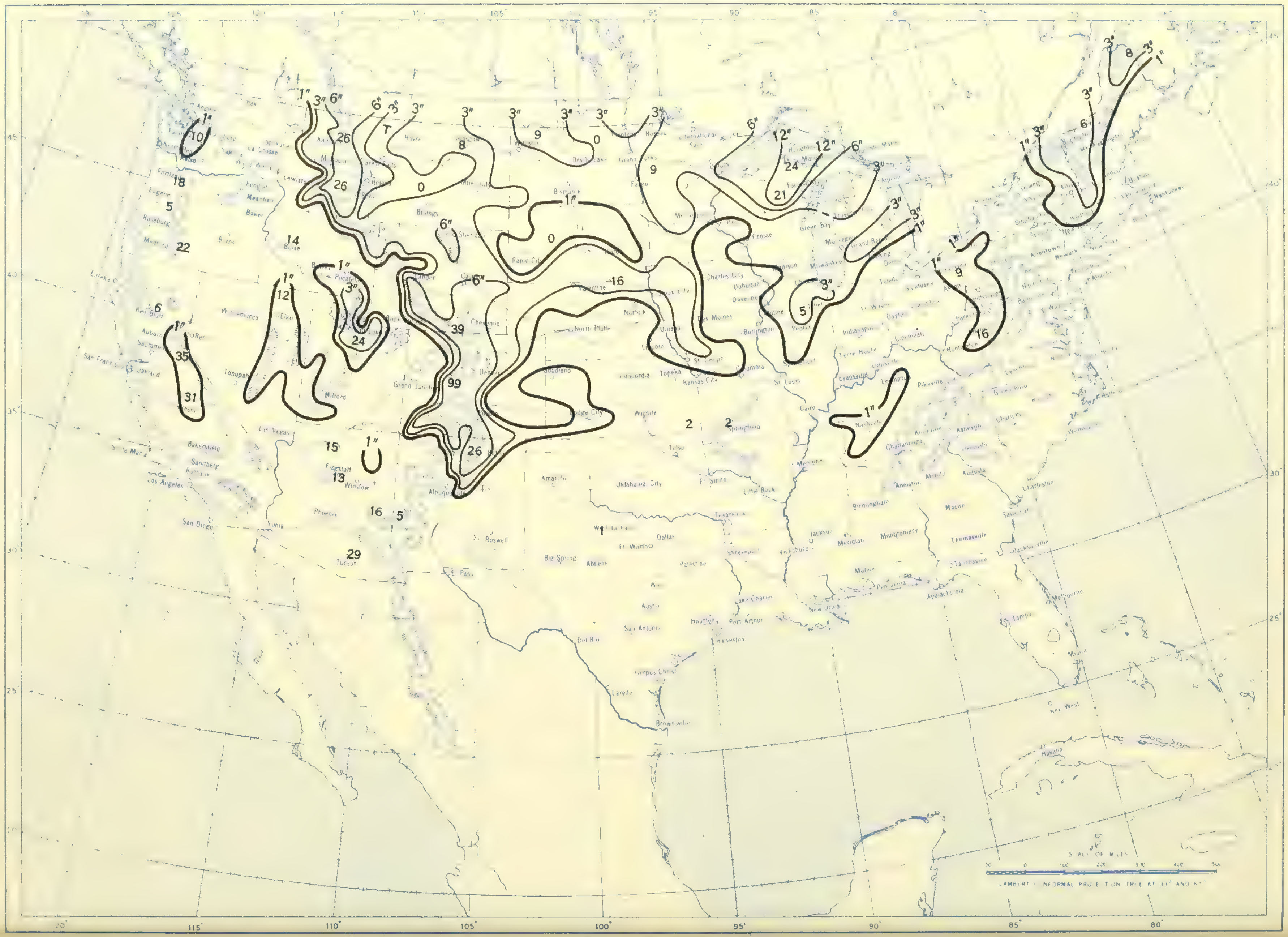


B. Percentage of Normal Precipitation, April 1951.



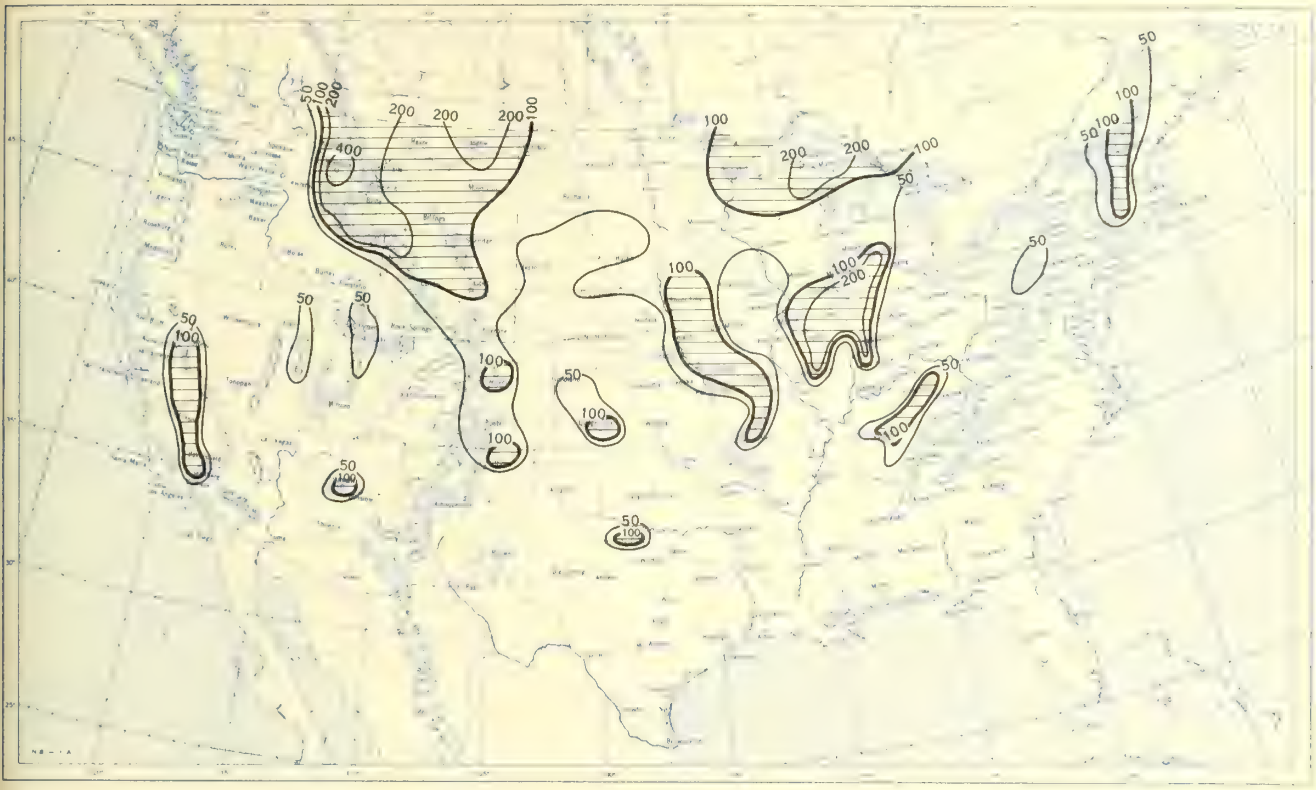
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), April 1951.



This is the total [illegible] during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the [illegible]

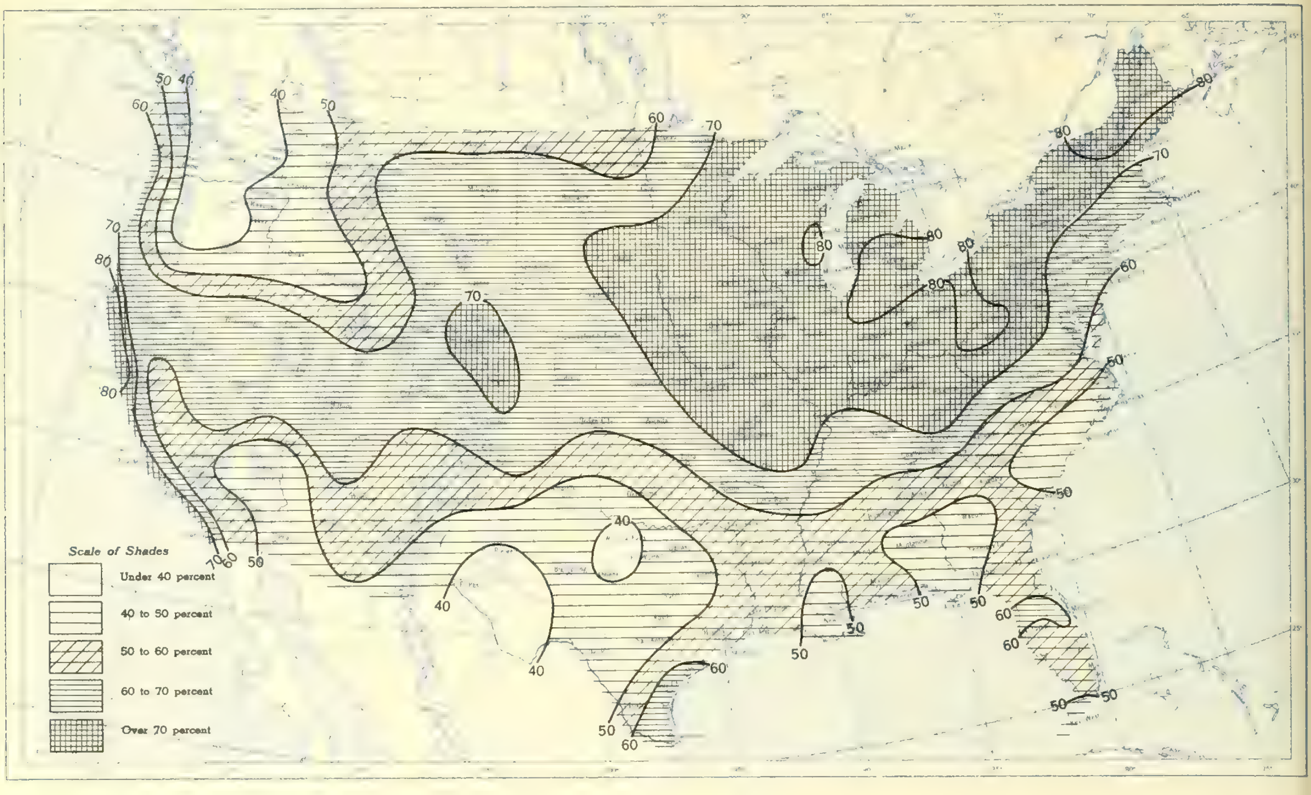
Chart V. A. Percentage of Normal Snowfall, April 1951.



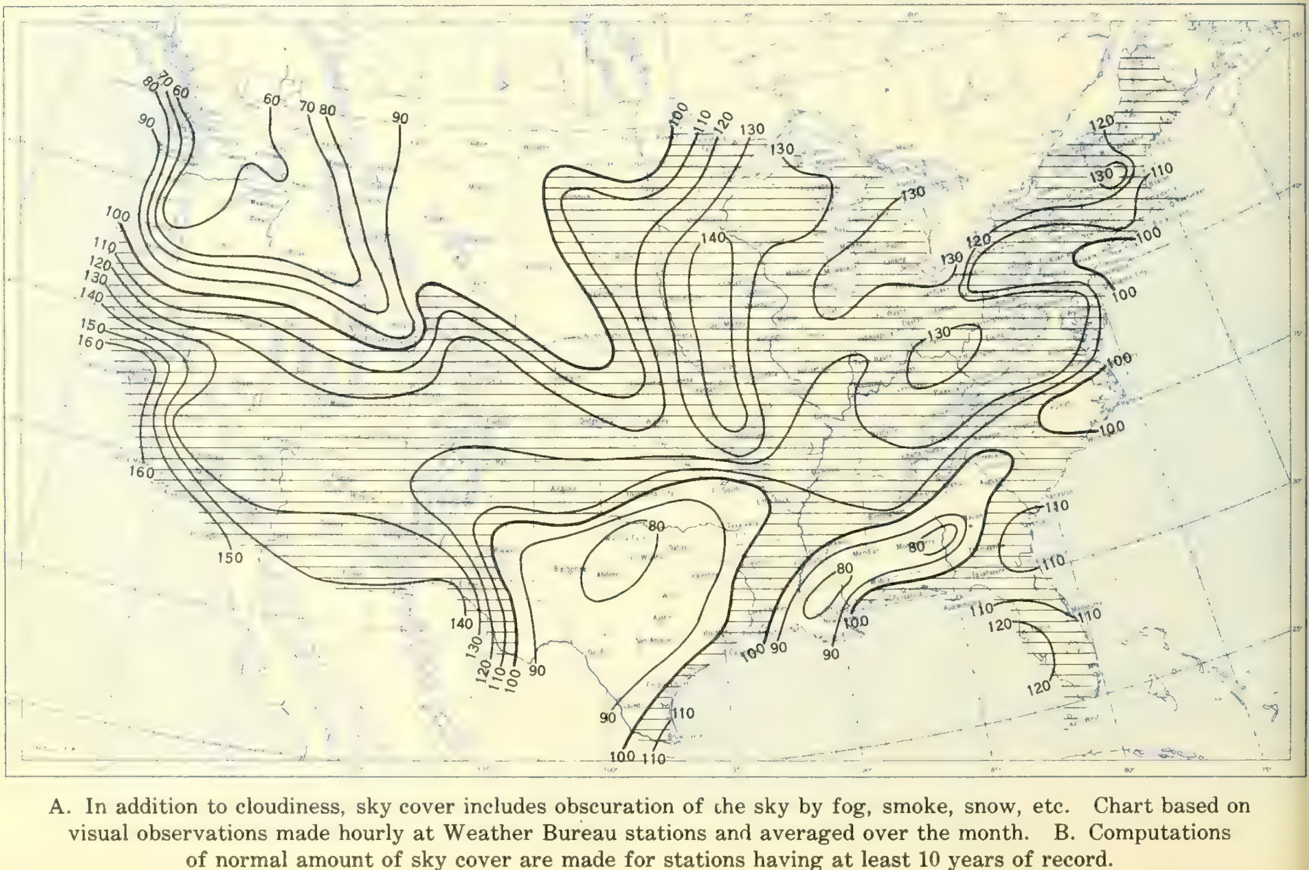
B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., April 24, 1951.

A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, April 1951.

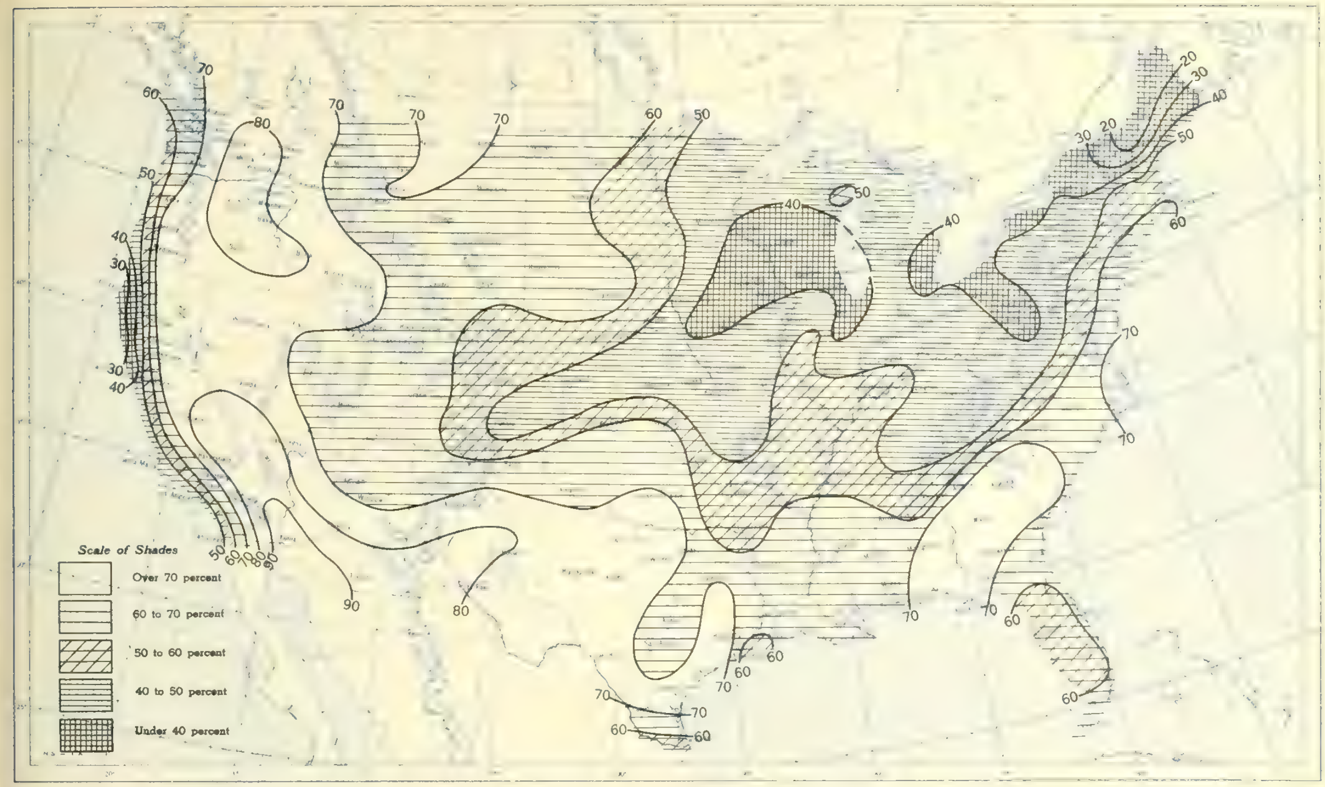


B. Percentage of Normal Sky Cover between Sunrise and Sunset, April 1951.

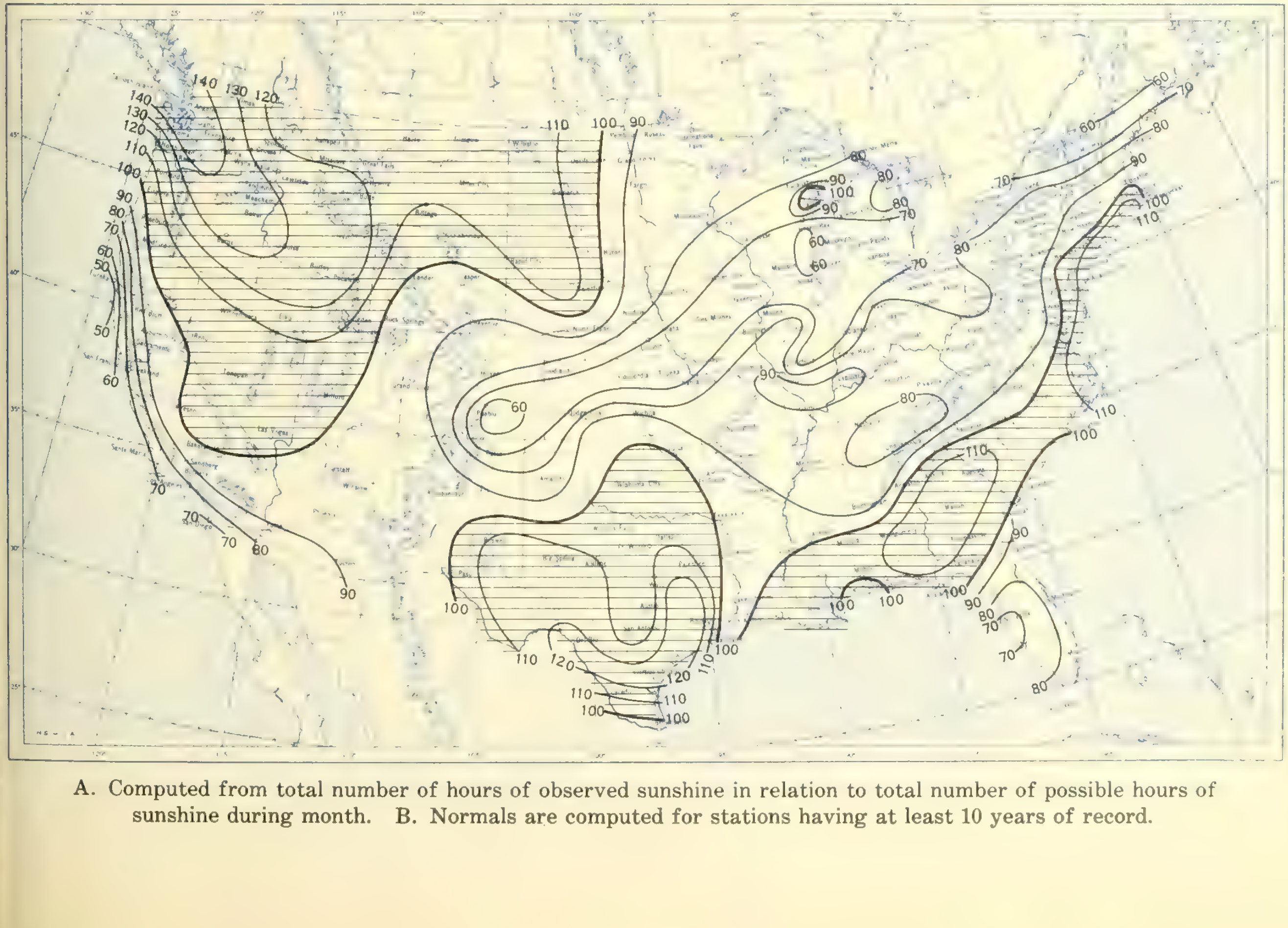


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, April 1951.



B. Percentage of Normal Sunshine, April 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, April 1951. Inset: Percentage of Normal Average Daily Solar Radiation, April 1951.

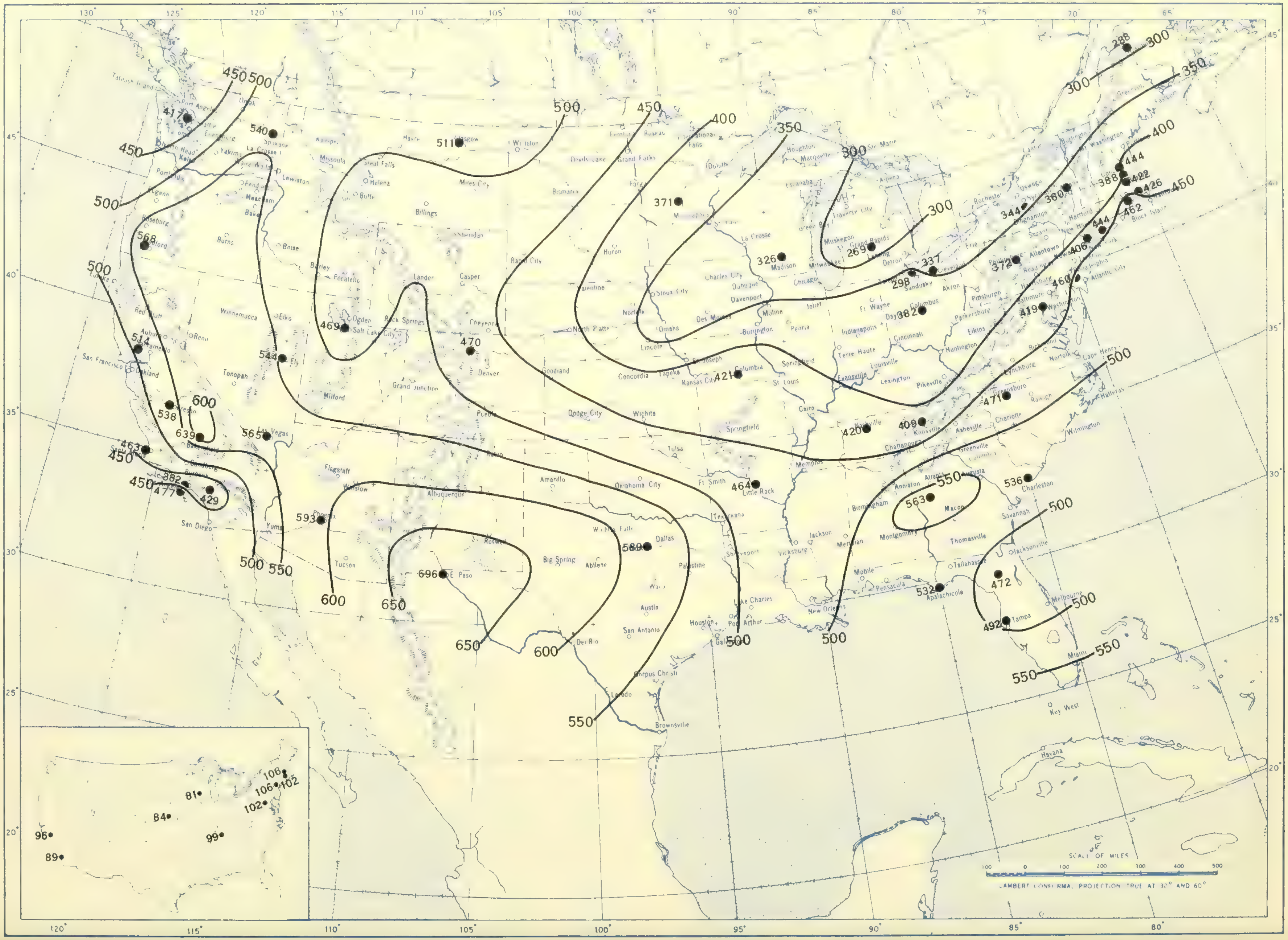
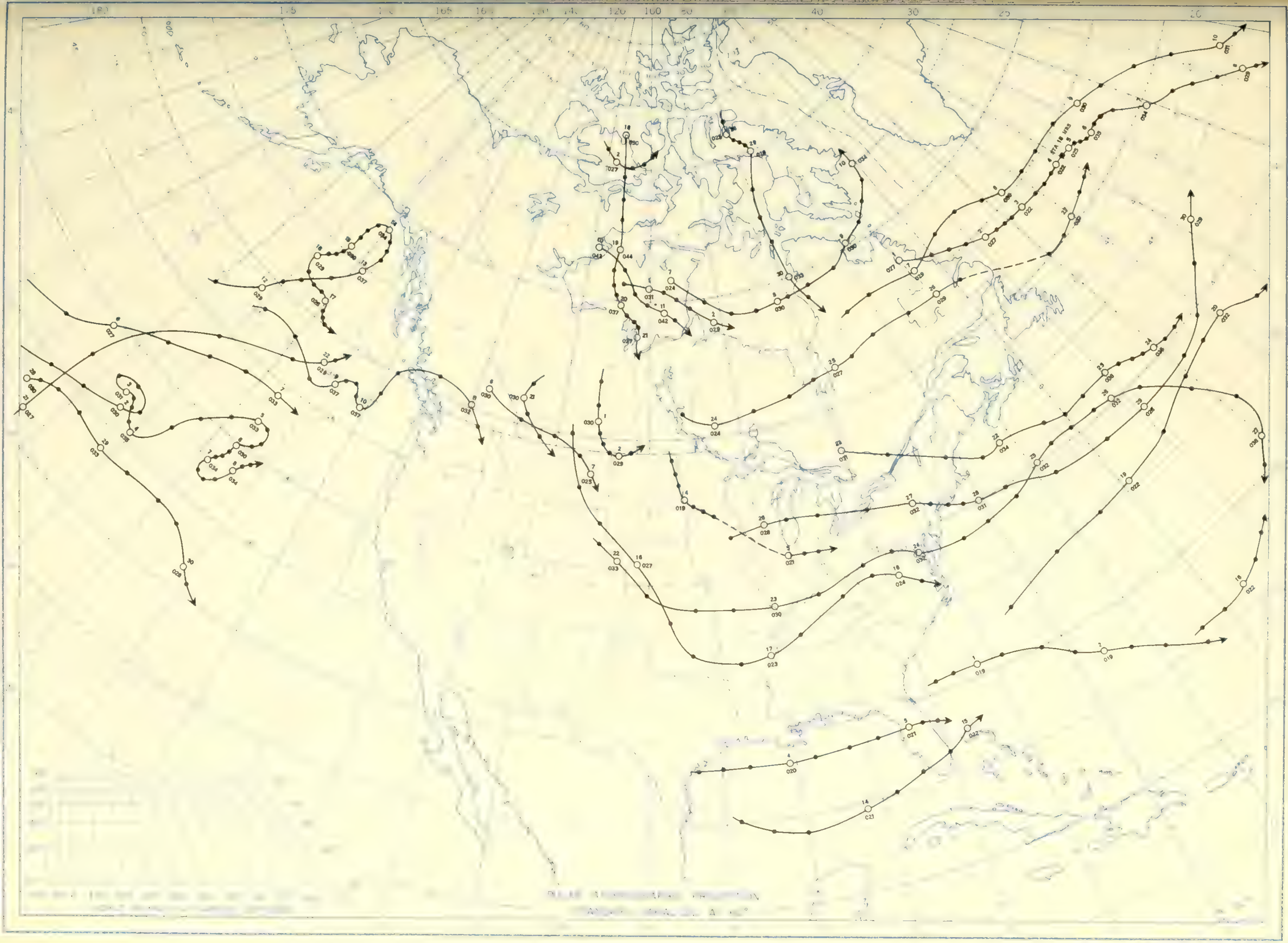


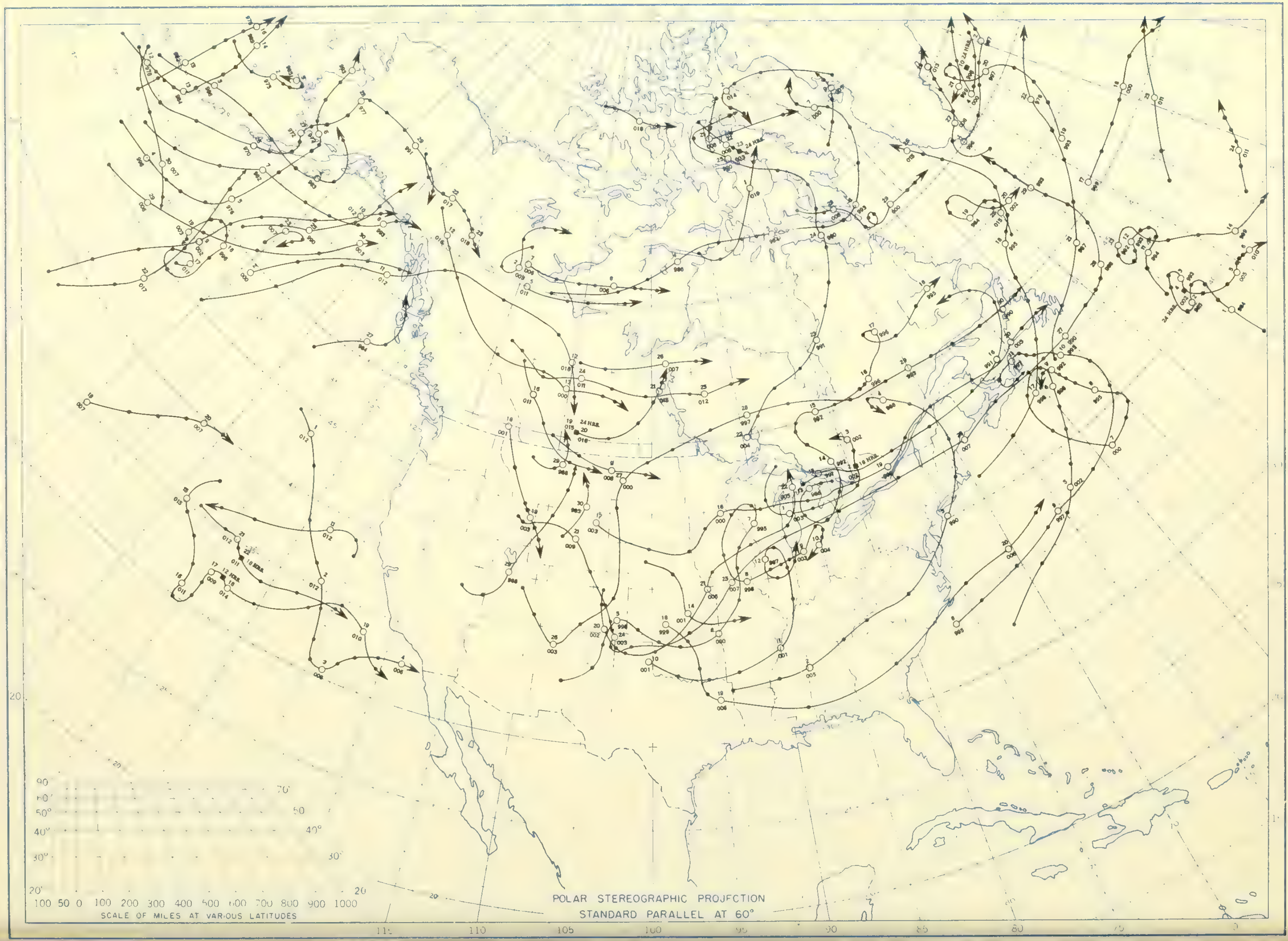
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines [illegible]

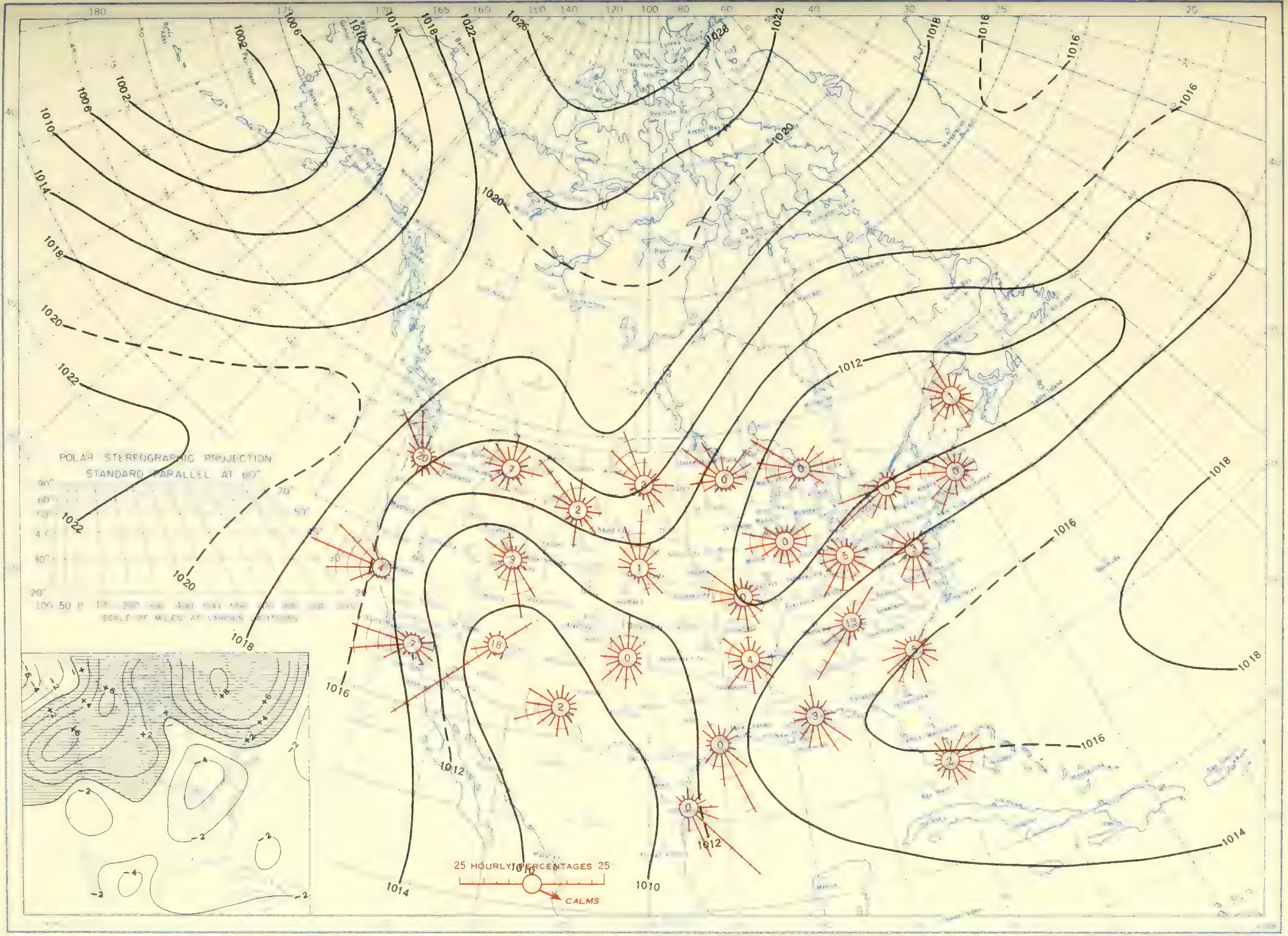
Chart IX.—Tracks of Centers of Anticyclones at Sea Level, April 1951



Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

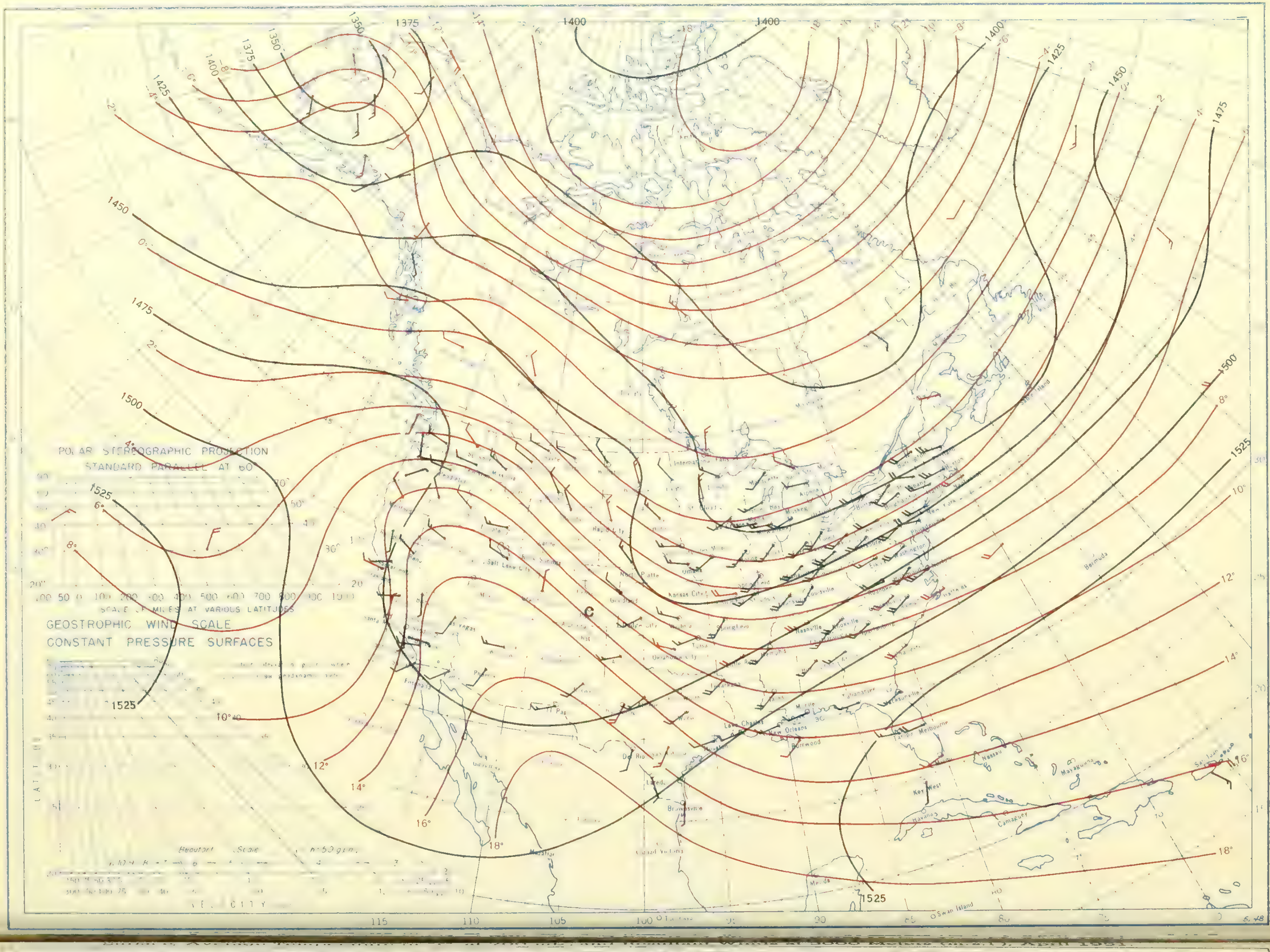
Chart X. Tracks of Centers of Cyclones at Sea Level, April, 1951.

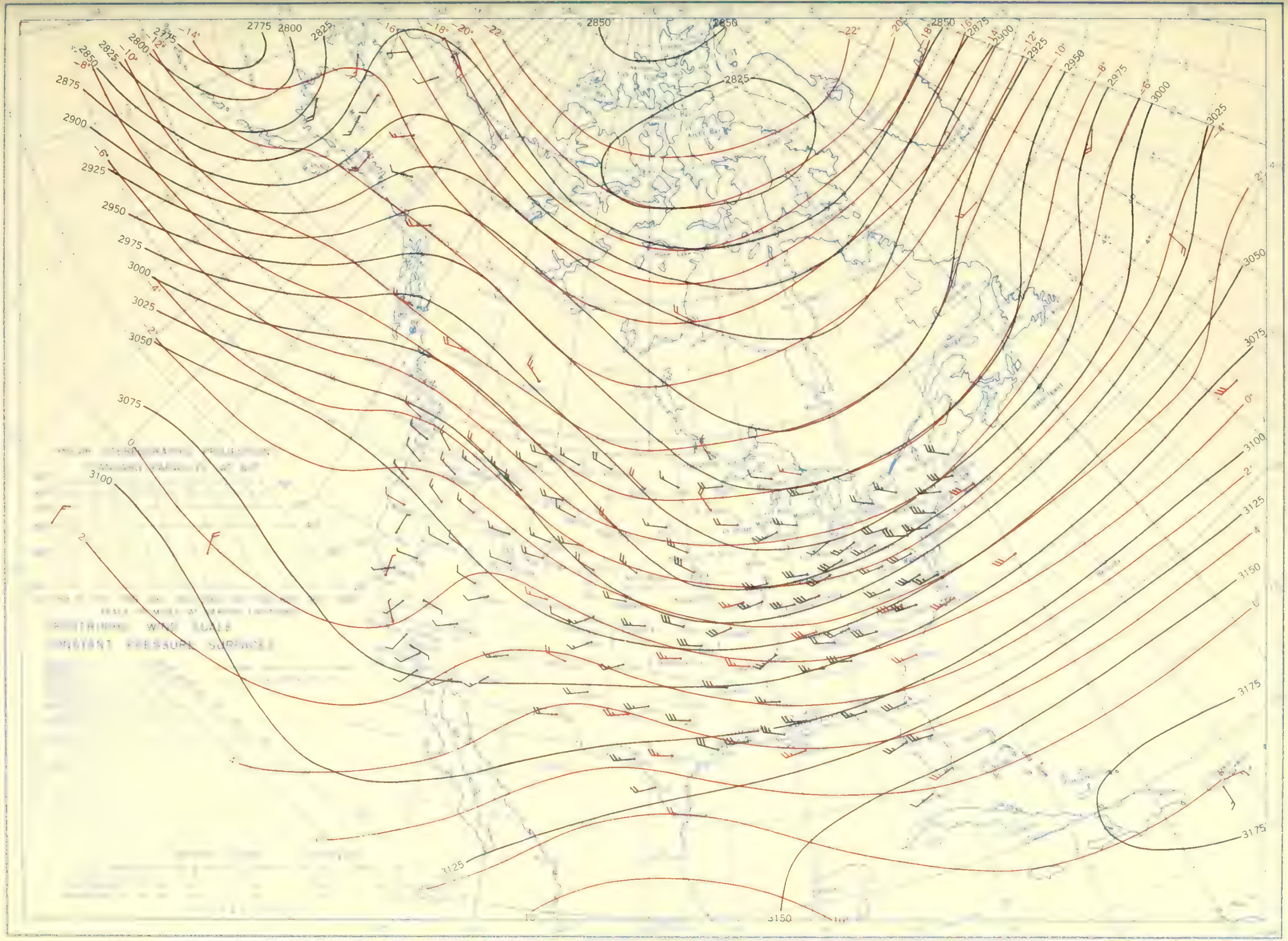




Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899–1939.

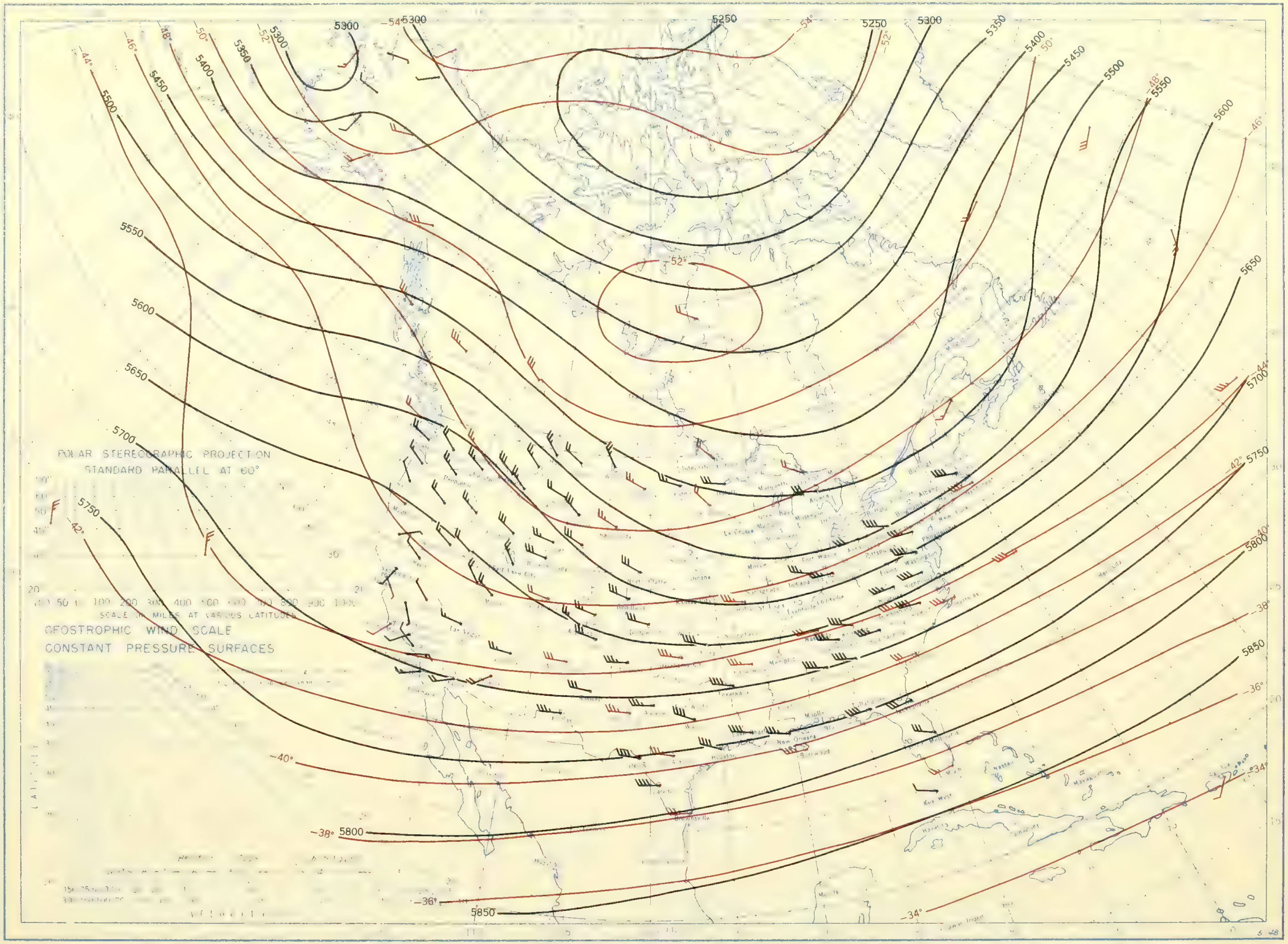
Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), April 1951.





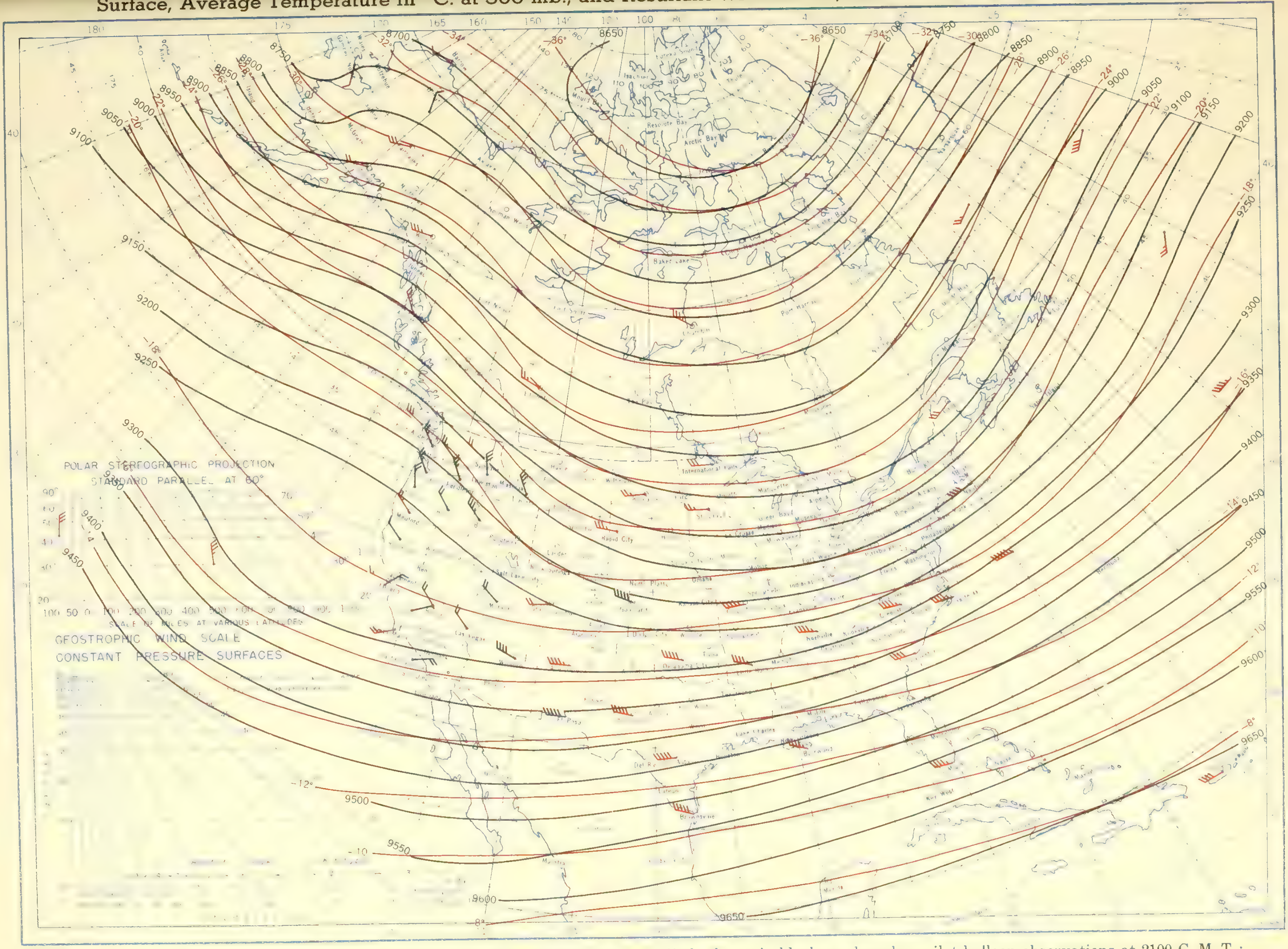
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), April 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters), of the 300-mb. Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), April 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

MAY 1951
Volume 2 No. 5

NEW ORLEANS: 1951

CONTENTS

SURFACE DATA Page

General Summary of Weather Conditions---------- 115

Condensed Climatological Data - States---------- 116

Climatological Data - Stations---------- 117

Heating Degree Days---------- 122

Severe Storms---------- 123

General Summary of River and Flood Conditions---------- 136

Flood Stage Data---------- 138

UPPER AIR DATA

Radiosonde Data---------- 140

Pilot Balloon Data---------- 143

Rawin Data---------- 144

SOLAR RADIATION DATA

Solar Radiation Intensities---------- 145

Blue Hill Data---------- 146

Daily Totals and Average Daily Totals by Weeks---------- 147

CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
[illegible]

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 5

MAY 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

For the country as a whole May was a little warmer and drier than usual. Near-record heat occurred in the South and Southwest, a drought developed in the deep South, and heavy rains fell in the central and lower Great Plains. The most unusual event was an early-season hurricane.

The nationwide temperature average for the month was 61.9°, which was 0.7° above the long-term mean. Monthly averages were slightly below normal at a number of stations in the Southeast, the central Great Plains, and in the extreme Northwest; but were above elsewhere, with departures as much as 5° at a few stations near the Great Lakes. Extreme temperatures for the month ranged from 4° recorded at Platoro Dam, Colo., and Bryce Canyon, Utah, on the 2d to 120° recorded at Cow Creek, Calif., on the 27th. Lowest temperatures in the far West occurred at nearly all stations during the first 3 days, while from the Great Plains to the Atlantic Coast the dates of lowest temperature varied in different sections but generally occurred before the middle of the month. The highest temperatures of the month were recorded in several northeastern sections either at the beginning or about the middle of the month, but were recorded in nearly all other sections during the last week. Several stations in the central Gulf area and in the Southwest experienced their highest May temperatures on record, and the highest temperature ever recorded in Mississippi was equaled at Hattiesburg on the 31st. Early-season high temperature records were recorded at many stations in the Southwest and at several in the Southeast. The lowest temperatures of record for the month occurred at a few stations in the extreme Northwest and the latest freeze of record at a number of stations near the north Pacific Coast, but elsewhere monthly minima were generally higher by 10° to 20° than the previous records.

Temperatures fluctuated considerably during the month. In the far West cold periods occurred at the beginning, about the middle, and again at the close of the month. During the first two periods freezing temperatures extended deep into southern sections, but were confined to mountainous areas and the extreme north during the last period. During the first cold period frost caused some damage to tender crops in parts of Washington and Oregon. Frost and freeze during the second period damaged fruit in Utah. The freeze at the end of the month damaged tender vegetables, sugarbeets, and fruit in Montana west of the Divide and some fruit, gardens, and spring wheat in Washington.

East of the Rockies the latest killing frost occurred in extreme northern areas about the middle of the month, but the only damage was to some tender vegetables and fruit in New England. The cold periods in the East were not unusual for the time of year, and freezing was generally limited to extreme northern areas.

The nationwide precipitation average was 2.35 inches, which was 0.50 inch below the long-term mean. Monthly totals were generally above normal in the central Great Plains, Arizona and southern Utah, northeastern California, a belt along the north Atlantic Coast extending from southern New England to northern Delaware, and in several small, widely scattered areas. The greatest monthly totals were recorded in the central Great Plains, with Apache, Okla., reporting 14.46 inches for the greatest monthly total in the country. Monthly totals ranged up to 13.65 inches in Texas, 12.84 in Kansas, and 10.18 in Nebraska. The heaviest 24-hour amounts also occurred in the area from Nebraska to Texas. While official 24-hour measurements ranged up to more than 9 inches, there were unofficial reports of as much as 19 inches. An estimated amount of 12 inches of rain fell a few miles west of Hays, Kan., mostly within a period of 3 or 4 hours, early on the morning of May 22. It caused a flood in Hays that inundated 75 blocks of the city with depths as much as 15 to 20 feet in some places, and six persons were drowned. Another heavy downpour occurred about 15 miles northeast of Clinton, Okla., during the night of the 16th and 17th, with amounts estimated up to 18 inches. At D'Hanis, Tex. an unofficial amount of 19 inches was reported on the 15th. Besides the numerous flash floods caused by these downpours, widespread flooding occurred in western Oklahoma as a result of heavy rains from the 14th to the 20th. Some small streams were the highest ever known. Four persons were drowned, and 250 families in Waurika and smaller numbers in Blackwell and Ponca City were forced to evacuate. Thousands of acres of farm lands were inundated, and highways and many bridges were damaged; total losses were expected to exceed $2,000,000. There was flooding in the upper Mississippi River from May 1 to 20.

Monthly totals of precipitation in the northwestern half of Arizona and in southern Utah were generally more than twice the normal May amounts, due largely to heavy rains that fell during the third week.

The greatest deficiencies of precipitation occurred in the southern States, parts of the Southwest, and in the extreme northern portion of the North Central States. Stations in these areas that received no precipitation during the month totaled more than 100, mostly in the Southwest with 50 in California, but there were 2 in the north-central section and several scattered stations in the Southeast without any rain. In many sections of the Southeast crops needed rain badly at the end of the month, with some deterioration evident in a few sections. Twelve thousand acres of forest land were burned in South Carolina. In several southwestern areas the need for rain was becoming critical.

The month's measurable snowfall was confined to higher elevations of the far West and extreme northern areas. Some light snow fell as far south as northwestern Kansas during the first week. During a snowstorm at the end of the month heavy amounts in western Montana accounted for most of that State's total snowfall, and light amounts fell in the western Dakotas, with Hettinger, N. Dak., measuring 2 inches. Snow fell in the Lake Region on several occasions, but amounts generally amounted to only a trace. Snow squalls occurred in the northeastern mountains as late as the 24th when Mt. Washington measured 4 inches. Several far western stations in the higher mountains measured monthly totals exceeding 20 inches. In general snowfall was below normal in areas that normally receive some snow during May.

Severe storms were of much greater frequency in Kansas than in any other State, but only one was outstanding. It was a severe hail- and windstorm which occurred in a large area of western Kansas on the 29th and 30th, causing crop, property, and livestock losses exceeding $6,000,000. The month's worst tornado swept through Archer County, Tex. on the 18th, leaving 2 persons dead, 100 injured, and damage totaling $1,500,000. Severe hailstorms caused $500,000 damage at Roswell, N. Mex. on the 20th and about $800,000 damage at Abilene, Texas on the 24th. Rather unusual for the section of the country in which it occurred, was a sandstorm which damaged crops in southeastern Missouri to the extent of $590,000 on the 27th. A pre-season hurricane, the earliest on record, appeared off the Florida coast on the 17th, and moving in a northerly course curved out into the Atlantic on the 21st. Its nearest approach to land was about 100 miles east of Ft. Pierce, Fla., and Cape Hatteras, N. C., and its only effects on land were fresh winds and light showers along the eastern coast of Florida on the 17th and the eastern coast of North Carolina on the 21st.

May weather generally favored agriculture. Several southern sections needed rain rather badly, but the need was not serious. Planting crops that were delayed during April in north-central areas progressed rapidly in most sections during the latter part of May, and sufficient moisture and warm, sunny days permitted good crop growth. In the far West range and crop growth were generally good and field activities normal or better.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 MAY 1951

Section	Temperature									Precipitation					
			Monthly extremes									Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F	°F		°F			°F		In.	In.		In.		In.
Alabama	70.5	-0.9	Chatom	101	31	Valley Head	31	8	1.15	-2.47	Fairhope	7.96	Jackson Lock 1	0.00
Arizona	65.7	-.1	4 stations	116	*26	3 stations	15	*2	.51	+.22	Mount Trumbull	1.70	21 stations	.00
Arkansas	69.1	.0	2 stations	101	31	Batesville Livestock	35	12	1.93	-3.18	Gilbert	4.31	Monticello	.12
California	63.2	+.1	Cow Creek	120	27	Twin Lakes	10	*2	.95	+.15	Vollmers	5.96	50 stations	.00
Colorado	53.5	+.9	Rocky Ford	99	28	Platoro Dam	1	*2	1.83	+.08	Two Buttes 1NW	8.18	Alamosa WB AP	.05
Connecticut	58.6	+1.1	2 stations	91	16	Putnam	27	11	3.98	-.16	Lake Konomoc	5.81	Candlewood Lake	2.55
Delaware	62.7	.5	3 stations	96	*16	Millsboro	35	11	3.63	-.02	Dover	4.76	Bridgeville	2.55
Florida	75.1	-.5	4 stations	98	*3	Jasper 10E	43	16	2.15	-1.42	Quincy Exp. Sta.	8.02	Pennusco 1NW	.00
Georgia	69.7	-2.1	Macon	99	31	Blairsville Exp. Sta	[illegible]	8	1.17	1.91	Donalsonville 2W	3.77	Savannah Beach	.25
Idaho	53.1	+.2	Kooskia	96	22	2 stations	16	*1	1.29	-.30	Burke 2NNE	1.90	Buhl	.22
Illinois	64.7	+2.0	Palestine	91	19	Lacon	33	*7	3.26	-.87	New Boston Dam 17	7.88	Carbondale Sew Plant	1.00
Indiana	63.7	+1.7	Edwardsport	95	20	5 stations	32	*12	3.12	-.68	La Porte	6.81	Cypress Dam	.69
Iowa	62.2	+1.8	2 stations	96	31	Grundy Center	26	11	5.09	+1.13	Tingley	9.22	Northwood	2.08
Kansas	61.2	+.1	Mound City	97	31	Oberlin	26	7	6.17	+2.66	Oxford	12.84	St. Francis 8NW	2.07
Kentucky	65.6	+.2	Princeton	95	18	2 stations	32	*12	2.66	-1.52	Laura	6.71	Cadiz Lock E	.29
Louisiana	73.7	+.3	Hammond	101	31	Tallulah Delta	41	21	1.79	2.87	Simpson	6.43	Franklinton	.30
Maine	53.6	+1.1	3 stations	90	*16	2 stations	23	*1	3.10	.11	Bar Harbor	5.56	Fort Fairfield	1.37
Maryland	62.7	.1	5 stations	92	*17	Oakland	26	11	2.84	-.81	Crisfield	5.33	Ocean City	.81
Massachusetts	57.4	+.8	3 stations	92	*16	Birch Hill Dam	25	*5	3.96	+.54	Beechwood	7.12	Provincetown	1.07
Michigan	57.1	+3.5	Boyne Falls	96	19	Kenton U S Forest	15	*10	2.17	.85	Ann Arbor	5.01	Upper South Dam	.64
Minnesota	58.1	+3.5	2 stations	89	*2	Cloquet Forest	21	10	2.99	-.16	Luverne	7.29	Argyle	.55
Mississippi	72.1	+.2	Hattiesburg	101	31	2 stations	40	13	1.04	-3.23	Van Vleet	6.92	6 stations	.00
Missouri	65.1	+.8	4 stations	91	*18	2 stations	30	*7	3.34	1.16	Grant City	7.18	Deering	.51
Montana	53.0	+.7	Miles City	100	23	Wisdom	17	5	1.57	.55	Polson	4.86	Reserve 14W	.01
Nebraska	59.8	+.5	6 stations	94	31	Broken Bow #2	22	7	1.74	+1.31	Stapleton	10.18	Dalton	.81
Nevada	56.9	.1	N. Las Vegas-Doxarm	112	26	Fish Creek Ranch	13	3	.49	-.29	Jarbidge	1.84	5 stations	.00
New Hampshire	54.7	+.7	2 stations	92	16	2 stations	20	*1	3.23	.03	West Alton	4.98	Berlin	1.49
New Jersey	61.6	+1.0	Chatsworth 5S	95	17	Layton 3NW	21	11	4.17	+.31	Cedar Grove	5.67	Atlantic City WB	1.99
New Mexico	61.7	+1.1	Hobbs	107	30	Bluewater	13	5	1.01	-.21	Cameron	6.17	18 stations	.00
New York	56.7	+.6	[illegible] stations	95	16	Saranac Lake	20	5	2.37	1.16	Lake Ronkonkoma	7.22	East Homer	.57
North Carolina	65.8	-1.1	1 station	95	*5	2 stations	25	*7	1.53	-2.42	Hatteras WB City	5.27	Mooresville	.16
North Dakota	56.6	+2.7	Baldhill Dam	94	25	Belcourt Ind. Res.	21	10	1.15	-1.11	Fullerton	3.11	2 stations	.00
Ohio	61.9	+1.5	Ironton	93	1	3 stations	30	11	3.31	-.41	New Carlisle	6.72	Catawba Is. 1SW	1.66
Oklahoma	68.1	+.2	Frederick	105	29	Kenton	28	1	5.16	+.61	Apache	14.16	Quinton	1.14
Oregon	51.0	.0	Hermiston	101	25	[illegible]	19	18	1.75	.00	Willamette Snow Lab.	5.87	McNary Dam	.21
Pennsylvania	59.8	-.2	Artemas	94	17	Kane 1NNE	24	15	2.72	1.29	Whitesburg	4.90	Martinsburg	.97
Rhode Island	58.1	+2.2	Providence WB City	91	16	Greenville	32	5	4.52	+1.14	Greenville	5.70	Block Island	3.28
South Carolina	69.2	1.7	Columbia WB AP	98	22	2 stations	36	*13	.98	-2.50	Walhalla	1.97	Batesburg	.00
South Dakota	57.2	+.8	Oahe Dam	92	28	Deerfield Dam	16	7	2.94	+.09	Wagner	6.11	Custer 8SW	.89
Tennessee	66	-.6	2 stations	97	*30	2 stations	33	*7	1.11	-2.69	Crandull	6.58	McEwen	.00
Texas	72.9	+.9	Presidio	111	*28	Mount Locke	29	1	3.55	+.11	Matagordo	13.65	3 stations	.00
Utah	56.2	+.1	Escalante River Mth.	105	21	Bryce Canyon CAA	1	2	1.23	+.11	Corinne	3.48	Moroni	.20
Vermont	54.3	+.2	Wilder	91	16	Somerset	20	1	2.67	-.61	Whitingham	4.51	Cornwall 1N	1.57
Virginia	66.1	.8	Holland 1E	94	21	Sugar Grove	23	13	2.62	1.17	Saltville	7.58	Buggs Island Dam	.88
Washington	54.8	.5	Richland 2NW	97	25	2 stations	19	*28	1.75	-.15	Mt. Baker Lodge	6.91	Coulee Dam 1SW	.19
West Virginia	61.9	-.1	Williamson	95	2	Canaan Valley	28	11	1.42	+.10	Pickens	7.87	Coburn Creek	1.27
Wisconsin	59.[illegible]	-1.1	2 stations	90	*1	Land O'Lakes	18	11	3.22	.29	Mellen Power Co. Dam	7.11	Manitowoc	.60
Wyoming	51.2	+1.1	do	91	*23	Kendall 3S	12	14	1.67	-.30	Lander WB AP	4.37	Deaver	.03
Alaska (March)	2.1	-8.5	Guard Island	52	30	Allakaket	63	2	1.20	-.18	Port Alexander	18.29	2 stations	T
Hawaii (April)	70.1	0	Puuieae	86	17	Haleakala	41	9	[illegible].99	-3.87	Kukui	20.00	5 stations	.00

CLIMATOLOGICAL DATA

Table 2

MAY 1951

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)					
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days Max. 90° F. or above	No. of days Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days .01 inch or more	No. of days With thunderstorms	Snow, Sleet, Hail Total	Snow, Sleet, Hail Max. depth	Average hourly speed	Prevailing direction	Fastest mile Speed	Fastest mile Direction	Fastest mile Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Percent of possible sunshine	Heating degree days
	Ft	Mb.	Mb.	°F	°F	°F	°F	°F		°F				°F	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.							%	
ALABAMA																																	
Birmingham	610	991.2	1016.2	83	55	68.9	-0.4									1.15	-2.80	0.79			0.0				65	NW	3						
Mobile CO	10	---	---	85			+.7									1.08	-3.24	.83			.0				31	NW	5				3.7		
Mobile	211	1007.8	1015.7		63																		10.4								4.3		
Montgomery CO	201	---	---																														
Montgomery	198	1008.5	1015.7																				6.2										
ARIZONA																																	
Flagstaff	6993	786.3	1014.5																				8.2										
Payson CO		846.6	1012.1																				5.5										
Phoenix CO	1083	---																					7.0									95	
Phoenix	1108	970.5	1008.9																				5.6								2.9		
Prescott	5014	845.6	1011.5																				10.1								4.0		
Tucson	2558	922.8	1009.0			74.0																	6.8								2.7		
Winslow		849.6	1009.3																				10.2								4.2		
Yuma	203	1004.1	1009.0			80.2																											
ARKANSAS																																	
Fort Smith	458	998.0	1014.6			69.9											-3.24	.69															
Little Rock	257	1002.4	1015.1			71.0											-3.18	1.23															
Texarkana	361	1002.0	1014.9															1.51												9	4.9		
CALIFORNIA																																	
Bakersfield		995	1013															.06					7.1					20	8	3	2.7		37
Beaumont CO	2589	923.	1013			61.6												.56					7.7										
Bishop		871	1009.8			63.9												.04															109
Blue Canyon	5280	838	1013.6															2.26													4.9	--	
Burbank	699	987	1013.9			63.6												.08							25	NW	12	14	12	5			72
Eureka CO		1016.	1018.6			52.9	+.9										-.42						7.5								6.5	46	367
Fresno	331	1001.	1013.1				+1.1										-.42	.02					8.8		32	NW	10	20	4	7	3.2	96	56
Los Angeles CO	312						+.9											.24					5.8		22	W	13	15	11	5	4.1	79	69
Los Angeles	99	1010.																													5.0		137
Mt. Shasta CO	3543	892.0	1015.8				-.2																										364
Oakland	3	1014.9	1015.7				+2.4																										162
Red Bluff	341	1001.	1013.5				+2.4																							10	4.6	77	
Sacramento CO	25																																
Sacramento	17	1012.	1013.6																				11.0										
Sandberg CO	4517	861.	1012.6																				19.3										256
San Diego	19	1011.	1014.4				+.9																6.8										
San Francisco CO						57.3	+.5																10.5				3	12					
San Francisco		1014.	1015.7			58	+2.5																11.3				10	13					
Santa Catalina	1568	959.	1013.9																								--	16					
Santa Maria	231	1007.	1015.8																				6.9										
COLORADO																																	
Alamosa	7534	770.9	1014.4			50.9																							11	17	7.0		
Colorado Springs	6175	810.0	1013.1			55.8																											
Denver	5292	835.1	1011.7				+2.1										-.72														7.1	61	248
Grand Junction	4849	856.4	1010.4			62.1	+1.0										-.17						10.1	ESE					13	14	6.8	69	151
Pueblo	4799	854	1011.3			60.9	+2.0										+.28														6.6	44	175
CONNECTICUT																																	
Bridgeport		1012	1012.7			59.6										3.93		1.99	11												6.1	--	175
Hartford		1007.1	1012.3			59.8	+2.3									4.23	+.63	2.18	10				7.6								7.0	54	179
New Haven		1008.5				58.7	+3.3									4.17		2.10	11				7.7								6.6	59	202
DELAWARE																																	
Wilmington																																	
FLORIDA																																	
Apalachicola CO		1014.2	1015.6				-1.0										-.28																
Daytona Beach		1013.5	1015				+.7										-1.11	.86															
Fort Myers		1014.9	1015.2			77.0											-1.98	1.96															
Jacksonville CO																																	
Jacksonville		1014.2	1015.4			74.9										1.46	-2.56																
Key West CO		1014.2	1014.9			80.3	+1.2									.06	-3.48										14	17					
Key West		1014.6	1014.8				+.6										-3.12											20					
Lakeland CO						75.5	-1.3										-3.48											17					
Melbourne						75.5										3.16	-.92	1.18									17	10					
Miami CO						76.2	-1.0									2.17		.75									11						
Miami		1013.9	1014.8			77.7												.71					8.9	SE			17	17					
Miami Beach						77.8												.30															
Orlando	111	1010.8	1015.2			75.7											-3.08	.69									26						
Pensacola CO	13	1013.5	1015.4			74.6	+.7									3.44	+.07	1.32									15	19					
Tallahassee		1013.	1015.6			74.1												1.47										14					
Tampa		1014.2	1015.4			77.4	+1.1									1.83	-1.16	1.44															
West Palm Beach		1013.	1014.6			77.0											+1.26	3.18															
GEORGIA																																	
Albany		1008.8	1015.6			73.7										2.16																	
Atlanta CO		---	---																														
Atlanta		974.3	1015.0													.47																	
Athens	798	987.1	1015.9			69.0										.55																	
Augusta	426	1008.1	1014.4			70.2										.48							7.0		*22								
Columbus	382	1001.7	1015.4			70.6										1.58					T		8.0										
Macon	354	1001.7	1014.5			72.0	---							53		1.11							9.1	NW	38								
Rome	637	992.6	1015.6			67.5										.61							6.9										
Savannah	38	1012.2	1014.6			72.3	+.6									.74																	
Valdosta	200	1007.1	1015.1			72.4	-1.9									2.13							9.0										
IDAHO																																	
Boise	2842	917.4	1012.			56.8	+.7																8.6		42		3	9					
Lewiston	1413	963.4	1015.			57.8																	4.4				--	10					
Pocatello		860.8	1012.			56.1	+3.1															T	10.3	SW	45								
ILLINOIS																																	
Cairo CO	314	1002.0	1014.6			69.7	+.3										-1.31	1.52	7				7.6										
Chicago	618	991.2	1013.8	73	51	62.1	+4.3										+1.40	2.93					9.3										
Joliet	580	992.6	1014.0														+.45	2.47					10.7										
Moline	589	992.6	1014.9			63.3	+3.0									5.90	+1.96	2.43					10.0										
Peoria	659	992.2	1014.4			63.9	+3.1									2.56	-1.50	1.04				T											
Springfield CO		---																															
Springfield		991.2	1014.1			64.5											-1.89	.91															

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	999.3	1014.8	79	53	66.2	+1.9	92	19	40	12	3	0	52	65	1.74	-2.12	0.85	9	5	T	T	8.3	NW	45	NW	27	12	8	11	5.1	79	74
Fort Wayne	801	983.1	1014.4	72	49	60.8	+1.6	86	20	38	12	0	0	50	72	3.68	-.17	2.01	10	4	.0	0	7.9	NW	40	S	20	7	13	11	5.7	67	174
Indianapolis CO	----	-----	------	--	--	----	----	--	--	--	--	-	-	--	--	----	-----	----	--	-	--	-	---	---	--	---	--	--	--	--	---	--	89
Indianapolis	796	985.4	1014.5	76	52	63.9	+2.5	88	19	38	7	0	0	52	70	2.78	-1.11	.82	11	6	.0	0	9.8	WSW	68	W	3	12	6	13	5.5	74	113
South Bend	768	985.8	1013.7	72	48	60.1	+.6	87	19	34	12	0	0	50	71	3.67	-.25	2.11	9	4	.0	0	11.3	NW	*32	ENE	10	9	7	15	6.1	--	198
Terre Haute	585	994.2	1014.8	76	52	63.8	+.4	88	19	37	7	0	0	53	70	2.58	-1.29	1.01	9	7	T	T	7.7	SW	52	NW	3	14	4	13	5.3	74	112
IOWA																																	
Burlington	605	989.2	1014.4	75	53	63.9	+1.3	88	18	37	7	0	0	51	67	3.70	-.44	1.56	13	7	.0	0	9.5	SSE	45	NW	26	7	11	13	6.2	67	121
Charles City CO	1013	978.7	1015.2	73	51	61.9	+4.1	82	1	34	11	0	0	--	--	2.89	-1.44	1.06	10	6	.0	0	6.4	---	35	SW	1	10	10	11	5.4	52	131
Davenport CO	579	992.6	------	74	55	64.4	+3.1	86	18	41	11	0	0	--	--	6.73	+2.79	2.97	15	5	T	T	---	---	--	---	--	--	--	--	---	--	115
Des Moines	800	984.1	1014.6	74	53	63.2	+2.9	85	15	38	11	0	0	50	67	5.56	+1.00	1.56	13	7	.0	0	11.7	S	50	NW	27	11	5	15	5.8	61	115
Dubuque	641	975.3	1014.1	71	50	60.6	----	83	1	39	11	0	0	50	70	5.68	-----	1.84	13	5	.0	0	10.4	SW	*31	SSW	25	9	8	14	6.4	--	173
Sioux City	1097	972.9	1013.6	73	50	61.7	+2.0	85	30	35	7	0	0	49	68	4.10	+.05	1.09	14	11	.0	0	9.9	S	42	S	1	11	5	15	6.1	75	134
KANSAS																																	
Concordia CO	1375	964.1	1013.5	74	54	63.9	+.7	89	31	38	7	0	0	--	--	3.34	-.84	.60	15	9	T	T	8.2	---	26	SE	13	11	8	12	5.4	58	83
Dodge City	2594	925.5	1012.0	74	52	63.2	-.3	91	31	36	7	2	0	50	68	8.69	+5.80	2.69	14	13	T	0	13.7	S	57	W	30	6	13	12	6.1	62	102
Goodland	3645	886.9	1012.1	73	46	59.1	-.3	89	28	33	6	0	0	45	67	2.45	-.07	1.34	10	10	T	0	12.4	S	*43	S	14	5	9	17	7.0	--	199
Topeka CO	----	-----	------	--	--	----	-----	--	--	--	--	-	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	59
Topeka	926	982.4	1014.1	77	53	64.7	----	93	31	36	7	1	0	53	71	4.12	-----	.97	13	12	T	T	10.2	S	47	SW	9	10	7	14	5.8	58	86
Wichita	1372	965.5	1013.2	74	56	65.3	+.2	92	30	41	7	2	0	53	69	7.60	+3.14	3.67	9	7	T	0	13.2	S	43	W	21	10	7	14	5.6	71	69
KENTUCKY																																	
Lexington	979	979.3	1014.8	78	53	65.3	+1.0	90	1	40	7	2	0	51	63	2.16	-1.65	.91	9	8	.0	0	8.8	SSW	--	---	--	13	10	8	5.0	--	89
Louisville CO	----	-----	------	--	--	----	----	--	--	--	--	-	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	65
Louisville	485	998.3	1014.4	80	54	66.6	+1.5	93	19	42	7	3	0	52	64	3.89	+.17	1.34	9	5	T	0	7.8	SE	57	SW	22	12	9	10	4.9	77	68
LOUISIANA																																	
Baton Rouge	64	1013.9	1015.3	86	63	74.5	+.3	95	31	55	24	9	0	62	69	1.07	-4.24	.93	3	3	.0	0	6.6	E	--	---	--	12	12	7	4.7	--	0
Lake Charles	12	1013.9	1015.2	86	64	74.8	+.8	95	31	56	17	7	0	63	75	.87	-3.95	.56	4	3	.0	0	9.0	SW	--	---	--	13	10	8	4.6	--	0
New Orleans CO	12	1013.5	------	85	68	76.8	+1.4	97	31	62	13	7	0	--	--	1.96	-2.64	1.83	3	3	.0	0	6.5	---	18	E	14	15	10	6	4.1	74	0
New Orleans	12	1014.6	1015.4	85	64	74.7	----	96	31	36	13	7	0	63	72	1.66	-----	1.54	4	3	.0	0	8.0	SW	*38	NNW	10	16	8	7	4.1	--	0
Shreveport	174	1005.4	1014.2	85	62	73.6	+.3	99	30	54	7	8	0	60	68	1.10	-3.12	.45	5	5	.0	0	9.2	SSE	28	S	1	12	12	7	4.6	75	4
MAINE																																	
Caribou	624	988.2	1011.2	62	39	50.5	+2.0	86	20	28	11	0	9	39	67	1.93	-1.11	.52	10	0	T	0	12.3	NW	40	NW	2	4	9	18	7.3	--	448
Eastport	33	1008.5	------	58	41	49.6	+1.9	81	16	31	3	0	2	--	--	4.16	+1.15	1.67	13	2	T	T	9.9	---	35	E	29	6	10	15	6.6	56	472
Portland	61	1007.8	1011.7	67	41	53.9	+2.7	90	16	26	4	1	7	43	70	2.66	-.74	.93	9	0	T	T	9.3	NW	34	NW	2	9	8	14	5.9	63	347
MARYLAND																																	
Baltimore CO	14	------	------	74	56	65.0	+.6	87	17	47	14	0	0	--	--	3.84	+.30	1.58	11	--	--	-	----	---	--	---	--	--	--	--	---	--	74
Baltimore	146	1008.8	1013.3	75	52	63.4	----	89	17	39	14	0	0	50	65	3.92	----	1.83	9	5	T	T	11.0	W	44	NW	11	10	7	14	6.0	50	101
Frederick	294	------	------	76	49	62.6	----	89	18	36	14	0	0	--	--	1.52	----	.44	12	2	.0	0	----	---	--	---	--	--	--	--	---	--	118
MASSACHUSETTS																																	
Boston	12	1007.5	1011.8	68	50	59.1	+2.0	91	16	41	5	1	0	45	65	4.81	+1.63	2.08	12	3	.0	0	11.8	NE	33	NE	24	7	11	13	6.2	59	215
Nantucket	43	1011.2	1011.8	61	47	54.2	+1.9	70	22	37	5	0	0	48	81	4.12	+1.27	1.66	11	6	.0	0	11.6	SW	40	NNE	24	7	9	15	6.5	60	331
Pittsfield	1153	969.9	------	67	43	55.2	+.7	82	26	29	5	0	3	--	--	3.52	+.45	1.15	11	3	.0	0	8.7	---	--	---	--	8	12	11	6.3	--	304
MICHIGAN																																	
Alpena CO	587	991.9	1014.2	63	46	54.5	+4.0	87	15	34	10	0	0	--	--	.97	-2.08	.54	7	1	.0	0	9.6	---	34	SE	26	9	14	8	5.6	73	330
Detroit	619	987.5	1014.0	71	49	59.9	+3.0	88	16	37	13	0	0	46	64	3.30	+.09	1.16	11	4	.0	0	9.0	N	35	NNW	20	11	10	10	5.4	66	192
Escanaba CO	594	992.2	1014.6	62	45	53.6	+4.0	81	8	28	13	0	1	--	--	2.00	-.93	1.42	9	1	.0	0	11.3	---	35	N	5	11	8	12	5.9	77	345
Grand Rapids CO	----	------	------	--	--	----	----	--	--	--	--	-	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	171
Grand Rapids	638	988.8	1014.0	72	48	59.6	+3.9	86	1	32	12	0	1	47	69	2.05	-1.39	1.00	10	2	.0	0	8.0	W	38	S	26	8	8	15	6.1	66	202
Lansing	859	982.1	1014.1	71	47	59.1	+2.3	85	16	34	13	0	0	48	69	3.08	-.34	1.03	13	5	.0	0	11.2	W	30	W	7	9	11	10	5.5	62	209
Marquette CO	677	987.5	1014.9	63	44	53.6	+4.6	84	14	27	13	0	4	--	--	3.03	+.07	.82	10	5	T	T	8.1	---	27	SW	14	3	13	15	7.1	60	365
Muskegon	627	990.5	1013.7	69	47	57.9	+3.6	85	1	32	12	0	1	47	71	1.43	-1.41	.41	10	2	.0	0	8.0	E	*22	SSW	25	6	14	11	6.2	--	236
Sault Ste. Marie	721	991.9	1014.7	65	42	53.0	+4.8	82	2	29	13	0	4	41	67	1.23	-1.41	.58	4	1	.0	0	8.8	NW	29	SW	14	8	9	14	6.3	52	363
Ypsilanti	722	985.4	1013.8	72	49	60.5	----	86	16	37	13	0	0	47	67	3.31	-----	1.27	10	4	T	0	10.7	NE	*29	ENE	10	9	10	12	5.8	--	173
MINNESOTA																																	
Duluth	1128	963.4	1015.2	64	42	53.0	----	80	23	28	13	0	6	41	69	2.83	-----	1.03	11	3	.5	T	13.3	E	38	NE	8	7	10	14	6.0	62	368
Intern'l Falls	1179	971.9	1015.3	68	41	54.7	+3.6	83	23	25	10	0	7	42	68	1.18	-1.40	.45	8	2	T	0	----	---	--	---	--	8	5	18	6.4	--	320
Minneapolis	830	981.0	1014.5	72	52	61.8	+4.1	81	24	38	5	0	0	47	63	4.14	+.47	1.68	12	5	T	T	12.2	NNW	36	NW	27	11	5	15	5.7	59	132
Rochester	1014	977.7	1014.4	73	49	60.7	+4.0	84	1	30	11	0	1	47	66	3.17	-.61	1.00	12	6	.0	0	9.6	S	--	---	--	9	4	18	6.6	--	158
St. Cloud	1034	976.6	1014.4	71	47	59.0	+2.7	82	24	33	10	0	0	45	65	2.87	-.62	1.20	12	7	T	0	8.7	NW	--	---	--	12	3	[illegible]	5.7	--	190
St. Paul	703	987.8	1013.8	72	52	62.1	+4.2	83	1	39	5	0	0	47	62	4.05	+.78	1.90	12	6	.0	0	10.6	NW	*65	SE	1	11	4	16	5.9	--	124
MISSISSIPPI																																	
Jackson	315	1004.1	1015.6	87	61	73.9	+1.4	99	31	50	12	11	0	55	57	.16	-4.51	.11	2	4	.0	0	7.4	SW	32	NW	5	14	13	4	4.2	79	3
Meridian	294	1002.4	1015.7	87	56	71.4	+1.1	99	31	45	13	12	0	56	64	.27	-4.05	.16	4	2	.0	0	5.6	NW	--	---	--	15	13	3	4.2	--	11
Vicksburg	234	1008.1	------	84	64	73.8	+.9	95	31	52	7	4	0	--	--	.48	-3.84	.45	3	2	.0	0	7.3	---	22	SW	9	10	13	8	5.2	78	6
MISSOURI																																	
Columbia	733	986.5	1014.4	77	54	65.3	+1.0	86	15	40	7	0	0	51	65	3.02	-1.44	1.27	10	12	.0	0	10.5	S	47	NW	27	11	7	13	5.5	77	76
Kansas City	741	979.7	1013.9	77	56	66.6	+1.8	94	31	43	6	1	0	51	62	3.92	-.02	1.11	12	8	.0	0	8.7	SSW	57	SW	31	13	8	10	4.9	65	55
St. Joseph	809	979.0	1013.7	77	54	65.4	+1.2	92	31	41	6	1	0	52	68	3.05	-1.65	.71	11	8	.0	0	10.5	SSE	56	S	25	13	6	12	5.3	63	75
St. Louis CO	465	------	------	78	58	68.1	+1.1	87	16	44	11	0	0	--	--	1.87	-2.47	.66	9	9	.0	0	11.7	---	42	N	27	12	12	7	4.6	84	55
St. Louis	465	993.9	1014.2	79	56	67.5	+1.7	89	18	43	7	0	0	50	58	2.57	-1.35	.90	11	8	.0	0	8.5	S	--	---	--	11	11	9	5.0	--	58
Springfield	1265	967.8	1014.7	75	53	64.1	+.4	89	31	38	7	0	0	52	67	3.60	-1.59	1.47	10	9	T	0	12.7	SSE	38	NW	27	14	5	12	5.1	71	97
MONTANA																																	
Billings	3568	889.6	1012.6	69	45	57.0	+.9	87	23	32	31	0	2	31	41	1.46	-----	.90	7	3	5.4	1	10.5	NNE	52	NW	25	12	10	9	5.2	71	249
Butte	5530	828.7	1016.0	60	34	46.8	-.6	79	22	19	3	0	14	31	61	1.83	+.07	.68	11	4	6.8	10	10.9	NW	--	---	--	7	7	17	6.8	--	556
Glasgow CO	2090	941.1	1013.6	72	44	57.7	+2.0	98	23	33	31	1	0	36	49	.63	-1.30	.31	7	2	.0	0	----	---	--	---	--	12	12	7	4.8	--	243
Great Falls	3664	887.2	1013.4	65	41	53.1	-1.5	85	22	31	31	0	4	31	49	2.23	-.01	.68	8	3	6.2	2	13.9	SW	65	SW	28	11	8	12	5.8	72	365
Havre CO	2488	925.2	1013.9	69	43	56.2	+2.8	92	23	32	29	1	1	--	--	3.06	+1.02	1.43	9	2	.0	0	9.9	---	49	W	28	11	11	9	5.3	69	275
Helena	3893	872.7	1014.4	65	40	52.1	+.5	85	23	27	29	0	3	34	55	1.00	-.98	.57	7	2	4.4	1	8.6	W	47	NW	25	9	5	17	6.3	68	394
Kalispell	2965	910.9	1014.0	62	39	50.9	----	80	11	28	29	0	1	36	63	2.31	-----	.82	11	1	5.0	5	9.8	S	--	---	--	6	10	15	6.6	--	433
Miles City	2629	929.9	1013.6	72	44	58.2	----	94	23	36	3	1	0	37	--	1.54	-----	1.03	5	1	.0	0	11.6	ENE	--	---	--	8	15	8	5.3	--	226
Missoula	3201	901.5	1015.8	64	39	51.6	-.6	86	22	27	29	0	3	36	62	1.29	-.46	.42	11	2	T	4	7.0	NW	42	SW	11	4	10	17	7.0	52	408
NEBRASKA																																	
Grand Island	1841	947.2	1012.6	72	50	60.8	----	84	31	31	7	0	1	49	69	7.65	-----	2.57	18	10	T	T	12.9	SSE	--	---	--	8	9	14	6.0	--	145
Lincoln CO	1184	970.9	------	74	53	63.5	+1.8	91	31	37	6	1	0	--	--	4.69	+.61	1.31	15	12	T	T	9.3	---	39	S	2	9	11	11	---	59	95
Lincoln	1180	970.9	1013.4	74	51	62.2	+1.6	90	31	36	7	1	0	51	71	6.71	+2.63	2.05	14	8	.0	0	10.2	SSE	--	---	--	9	11	11	5.6	--	120
Norfolk	1554	958.7	1013.8	72	50	60.7	+.5	82	30	33	7	0	0	49	70	4.48	+.53	1.68	17	11	T	0	12.2	SSE	--	---	--	8	10	13	5.9	--	149
North Platte	2783	914.3	1012.5	70	47	58.2	-.5	81	28	31	7	0	1	45	70	7.11	+4.33	2.78	13	13	T	0	10.8	SE	42	S	30	6	8	17	6.8	47	207
Omaha	978	974.3	1013.6	74	53	63.7	+1.3	87	31	40	7	0	0	50	65	7.09	+3.32	1.67	13	9	.0	0	11.2	SSE	46	NW	31	12	7	12	5.4	63	94
Scottsbluff	3950	878.1	1012.6	70	44	57.0	+.6	90	28	35	11	1	0	39	62	2.44	-.28	.84	12	10	T	0	9.8	ESE	--	---	--	4	11	16	6.8	--	248
Valentine CO	2581	922.8	1014.2	67	46	56.6	+.4	79	23	29	6	0	1	--	--	2.58	-.24	.52	15	8	T	0	9.3	---	39	S	13	8	9	14	6.3	63	255

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
NEVADA																																	
Elko	5075	843.2	1013.6	69	35	52.0	----	88	27	19	14	0	11	35	57	0.15	-----	0.06	7	1	0.4	T	7.8	W	--	---	--	9	13	9	5.3	--	396
Ely	6257	807.7	1013.5	66	35	50.3	+2.4	87	27	18	13	0	9	--	--	.48	-.91	.25	10	7	T	T	11.9	---	60	SW	26	7	10	14	6.5	49	449
Las Vegas	2162	933.8	1008.1	87	59	72.8	+2.3	109	26	45	2	13	0	24	21	.10	-.08	.10	1	1	.0	0	8.5	SW	--	---	--	14	11	6	4.5	77	33
Reno	4397	860.8	1013.7	71	37	53.8	+.9	89	26	26	2	0	9	34	51	.71	+.08	.41	7	1	T	T	6.0	WNW	47	S	3	14	9	8	4.3	84	348
Winnemucca	4299	865.9	1013.7	71	37	54.1	+.2	89	26	24	13	0	6	32	46	.37	-.51	.21	5	1	T	0	6.6	---	61	N	20	9	9	13	5.8	86	334
NEW HAMPSHIRE																																	
Concord	339	1001.4	1012.0	71	41	55.8	+2.9	91	16	26	5	1	6	42	63	3.38	+.37	1.50	10	1	.0	0	5.9	NW	31	NW	2	11	7	13	5.8	59	294
Mt. Washington	6262	803.0	1016.3	41	29	34.7	-1.0	57	26	11	4	0	17	--	--	1.78	-3.94	.71	10	0	4.2	12	26.1	W	--	---	--	7	7	17	6.7	39	931
NEW JERSEY																																	
Atlantic City CO	8	1010.2	1012.2	68	54	61.0	+2.9	84	2	47	14	0	0	--	--	1.99	-1.06	.89	11	4	.0	0	16.2	---	59	NE	18	7	12	12	6.3	62	139
Newark	11	1010.8	1012.2	73	53	62.8	+1.4	92	16	44	14	1	0	48	62	5.16	+1.24	1.92	9	4	.0	0	9.8	E	*35	N	24	5	13	13	6.5	--	116
Trenton CO	56	1005.8	1012.5	73	52	62.3	+1.2	88	16	44	14	0	0	--	--	4.48	+1.40	1.98	7	4	.0	0	8.8	---	29	N	23	4	12	15	6.7	61	124
NEW MEXICO																																	
Albuquerque	5310	846.3	1008.4	81	52	66.5	+3.2	98	27	36	3	7	0	28	28	.10	-.50	.10	1	2	T	T	10.6	S	56	SW	30	11	13	7	4.8	74	81
Clayton	4969	846.3	1011.4	75	46	60.4	+.4	88	28	28	1	0	1	44	65	4.09	+1.62	2.14	7	11	T	0	15.9	SSW	--	---	--	6	13	12	6.1	--	175
Raton	6379	803.9	1011.0	71	40	55.7	----	89	28	22	1	0	4	34	51	1.99	-----	1.04	10	13	.6	T	10.6	SSW	--	---	--	5	8	18	7.0	--	298
Roswell	3611	888.6	1009.5	87	52	69.4	0	103	27	38	2	10	0	40	40	.87	-.22	.77	2	6	T	0	11.1	SSE	53	NW	20	15	9	7	4.1	77	42
NEW YORK																																	
Albany	277	1008.5	1011.9	71	46	58.7	+1.0	89	26	31	4	0	3	44	61	2.79	+.20	1.46	8	4	.0	0	7.3	WNW	31	NW	7	7	13	11	6.2	64	220
Bear Mountain	1300	------	------	67	50	58.4	----	85	16	38	4	0	0	--	--	4.11	-----	1.09	10	5	.0	0	----	---	--	---	--	8	10	13	6.0	--	231
Binghamton CO	858	------	------	71	46	58.5	+1.1	87	16	31	14	0	0	--	--	1.41	-1.90	.54	9	4	.0	0	5.8	---	23	N	24	8	9	14	6.1	65	222
Binghamton	828	------	1013.1	70	44	56.6	----	85	16	27	14	0	6	45	69	1.80	-----	.60	8	4	.0	0	6.9	WSW	--	---	--	9	9	13	6.1	--	269
Buffalo	693	986.8	1014.3	68	47	57.5	+1.6	85	19	34	13	0	0	44	66	2.01	-1.09	1.00	10	4	.0	0	12.0	SW	34	SW	9	8	16	7	5.4	68	246
New York CO	10	1000.3	------	71	54	62.2	+1.6	87	16	46	4	0	0	--	--	5.33	+2.09	2.01	8	4	.0	0	12.4	---	52	NW	2	6	14	11	6.1	65	121
New York	19	1010.5	1012.3	72	54	62.9	----	90	16	45	4	1	0	47	62	5.46	-----	2.08	9	2	.0	0	11.8	NE	47	N	24	6	11	14	6.4	--	108
Oswego	292	1000.7	1012.9	64	48	55.7	+2.0	82	16	38	4	0	0	--	--	1.73	-1.31	.53	11	6	T	0	7.8	---	24	SE	11	11	12	8	4.6	71	302
Rochester	543	994.6	1013.6	70	46	58.1	+1.0	88	26	34	4	0	0	44	63	1.82	-1.12	.76	9	4	T	0	9.9	SW	30	W	7	11	12	8	5.0	69	237
Schenectady	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	204
Syracuse	399	991.5	1013.2	70	46	58.0	+1.7	87	26	32	4	0	1	44	62	1.97	-1.03	.83	11	4	T	T	9.9	NW	28	S	27	11	9	11	5.6	68	249
NORTH CAROLINA																																	
Asheville CO	2203	------	------	76	50	63.1	+.5	88	31	39	12	0	0	--	--	.59	-2.84	.14	10	8	.0	0	7.3	---	36	NW	4	10	15	6	4.5	73	104
Asheville	2093	------	1015.0	--	--	----	----	---	--	--	--	-	-	49	71	----	-----	----	--	--	---	-	6.7	NNW	--	---	--	--	--	--	---	--	---
Charlotte	753	987.1	1014.3	82	55	68.6	+.5	93	22	46	13	3	0	50	57	.34	-3.29	.16	4	4	.0	0	7.4	N	34	S	11	13	14	4	4.5	80	29
Greensboro	891	982.7	1014.4	79	52	65.6	-.8	90	2	39	13	2	0	50	60	.42	-3.62	.18	7	2	.0	0	9.0	SW	29	SW	11	15	9	7	4.5	66	49
Hatteras	4	1012.5	1012.8	73	62	67.5	-1.2	82	31	54	7	0	0	60	77	5.27	+1.56	2.42	14	12	.0	0	12.8	NNE	35	NW	18	14	7	10	4.7	73	17
Raleigh CO	400	------	------	80	56	67.9	-.6	90	2	48	6	2	0	--	--	1.84	-1.97	.65	10	6	.0	0	5.5	---	25	W	23	9	18	4	4.6	67	29
Raleigh	438	998.0	1013.7	80	53	66.2	----	90	22	44	15	2	0	52	65	1.77	-----	.98	10	6	T	0	6.5	SW	--	---	--	13	12	6	4.4	--	41
Wilmington CO	6	1012.2	1013.6	79	60	69.6	-1.2	90	22	52	15	1	0	--	--	1.22	-2.22	.83	5	4	.0	0	8.9	---	29	SW	11	9	14	8	5.1	61	8
Wilmington	30	------	1013.7	--	--	----	----	--	--	--	--	--	--	56	--	----	-----	----	--	--	---	-	7.2	SW	--	---	--	--	--	--	---	--	---
Winston-Salem	867	979.7	1014.5	79	54	66.6	+.1	92	2	43	13	2	0	48	55	.42	-3.47	.21	11	2	.0	0	10.8	NNW	--	---	--	16	8	7	4.4	--	46
NORTH DAKOTA																																	
Bismarck	1653	954.6	1014.6	71	43	56.8	+3.8	88	23	30	11	0	2	39	57	1.21	-1.11	.39	8	3	.0	0	10.9	SSE	42	SE	12	7	13	11	5.9	85	257
Devils Lake CO	1471	961.4	1014.2	70	44	56.9	+4.3	86	23	30	10	0	1	--	--	.86	-1.17	.42	5	2	.0	0	9.3	---	34	NW	29	15	10	6	4.1	79	355
Fargo	895	979.7	1014.0	72	46	58.8	+3.7	86	24	30	10	0	1	41	55	1.63	-1.26	.91	11	4	.0	0	13.4	NNE	45	SE	1	12	10	9	4.8	80	203
Williston CO	1877	945.8	1014.2	69	44	56.4	+2.4	92	23	31	6	1	1	37	54	.54	-1.52	.27	5	1	.0	0	8.1	---	33	W	24	9	11	11	5.7	77	278
OHIO																																	
Akron	1210	969.5	1014.0	71	47	59.1	-.1	82	16	36	24	0	0	48	68	3.07	-.83	1.01	9	7	T	0	8.3	N	--	---	--	11	11	9	5.2	--	198
Cincinnati OBS	761	------	------	78	54	66.0	+2.9	90	2	41	7	1	0	--	--	2.91	-.79	.73	11	8	T	0	5.7	---	30	W	26	--	--	--	---	61	79
Cincinnati	871	982.7	1014.3	77	53	65.0	----	92	1	40	7	1	0	52	66	2.94	----	.95	11	8	T	0	8.9	WSW	--	---	--	14	9	8	4.9	--	100
Cleveland CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	187
Cleveland	787	986.5	1013.6	73	49	60.9	+2.8	86	31	37	14	0	0	47	65	2.60	-.52	1.10	9	3	.0	0	10.4	N	43	N	3	12	10	9	4.9	59	168
Columbus CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	99
Columbus	724	984.1	1013.9	76	51	63.1	+2.7	87	1	42	7	0	0	51	68	3.18	-.41	.89	10	6	.0	0	7.5	NW	40	NW	2	10	14	7	5.2	66	119
Dayton	1002	978.0	1013.9	74	52	63.2	+1.4	88	1	40	7	0	0	50	67	3.28	-.32	1.40	13	9	T	0	9.8	NW	56	SW	26	11	11	9	5.4	71	127
Sandusky	603	991.9	------	70	52	61.0	+1.8	88	16	41	14	0	0	--	--	2.46	-.69	1.33	10	3	.0	0	8.1	---	26	SW	26	11	10	10	5.2	72	168
Toledo	621	990.9	1013.9	71	49	60.0	+2.0	87	20	37	14	0	0	49	69	2.71	-.78	1.18	9	5	.0	0	10.9	ENE	50	SW	20	9	10	12	5.8	56	180
Youngstown	1178	971.2	1013.5	71	47	59.0	+1.2	84	16	37	14	0	0	47	67	2.10	-1.05	1.01	7	5	.0	0	8.9	NW	*35	W	27	10	13	8	5.2	--	193
OKLAHOMA																																	
Oklahoma City CO	1254	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	27
Oklahoma City	1254	967.8	1013.5	77	58	67.4	-.3	92	30	47	7	3	0	56	71	7.85	+2.97	3.51	11	11	T	0	15.9	SSE	50	N	27	10	12	9	5.4	63	32
Tulsa	672	989.8	1013.6	80	58	68.9	+1.7	94	31	42	7	4	0	54	65	1.76	-3.29	.58	9	7	.0	0	11.1	S	45	SW	19	10	10	11	5.2	75	35
OREGON																																	
Baker	3369	------	------	--	--	----	----	--	--	--	--	--	--	37	--	----	-----	----	--	--	---	-	8.3	NNW	--	---	--	--	--	--	---	--	--
Baker CO	3446	895.0	1015.7	66	39	52.4	+.7	80	22	30	1	0	3	--	--	.97	-.58	.61	6	2	.0	0	6.4	---	24	NE	°30	10	9	12	5.5	71	384
Burns CO	4140	872.3	1014.7	67	39	53.3	+2.4	82	22	26	2	0	2	33	50	.52	-.24	.39	5	1	T	0	----	---	--	---	--	11	12	8	5.3	--	355
Eugene	364	1005.1	1018.7	69	43	56.2	----	84	21	36	2	0	0	46	73	1.75	-----	.73	13	2	.0	0	7.8	N	--	---	--	8	7	16	6.2	--	265
Meacham	4050	876.7	1017.1	60	37	48.5	----	81	22	27	29	0	9	37	66	1.29	-----	.64	7	3	.3	T	6.8	WNW	--	---	--	5	14	12	6.6	--	505
Medford	1314	969.5	1017.0	73	44	58.4	+.2	90	21	35	28	1	0	42	61	.51	-.59	.19	10	2	T	T	7.1	NW	*28	SE	3	11	8	12	5.6	--	211
Pendleton	1482	962.1	1015.7	71	46	58.5	+1.4	94	22	37	30	1	0	38	50	.44	-.85	.33	4	1	.0	0	10.2	WSW	--	---	--	8	13	10	5.3	--	209
Portland CO	30	------	------	68	49	58.4	+1.5	87	22	41	2	0	0	--	--	1.61	-.58	.46	12	--	.0	0	----	---	--	---	--	--	--	--	---	--	207
Portland	21	1016.9	1018.2	67	47	56.8	+1.3	85	22	37	2	0	0	47	72	1.75	-----	.57	12	0	.0	0	5.6	NW	26	SE	12	5	9	17	7.1	47	253
Roseburg CO	479	999.7	1018.3	70	47	58.5	+2.5	88	21	37	28	0	0	--	--	1.30	-.63	.44	10	2	T	0	5.1	---	20	SW	°4	11	6	14	6.2	70	203
Salem	195	1010.8	1018.3	69	43	55.9	-.4	85	21	34	2	0	0	45	72	2.49	+.47	1.01	12	0	T	0	7.0	S	--	---	--	4	12	15	6.9	--	281
Sexton Summit CO	3836	------	------	60	39	49.2	----	79	22	29	28	0	6	--	--	1.96	-----	.68	11	3	4.9	T	----	---	--	---	--	11	7	13	6.0	--	482
Troutdale	29	------	------	69	46	57.3	----	86	22	35	29	0	0	--	--	2.89	-----	.83	13	1	.0	0	----	---	--	---	--	6	9	16	7.0	--	233
PENNSYLVANIA																																	
Allentown	381	999.0	1012.9	73	49	60.9	+.4	92	17	33	14	1	0	48	66	4.27	+.77	1.73	9	6	.0	0	7.9	SW	--	---	--	8	10	13	6.1	--	153
Curwensville	2215	------	------	68	44	56.3	----	82	16	34	13	0	0	44	68	2.57	-----	.74	12	6	.0	0	10.5	WNW	*28	NW	7	4	13	14	6.6	--	270
Erie CO	655	------	------	66	51	58.5	+1.7	82	16	41	13	0	0	--	--	2.78	-.62	1.01	11	4	.0	0	7.6	---	25	SW	26	15	8	8	4.4	71	224
Harrisburg	335	999.0	1012.6	73	51	62.1	+.3	91	17	38	14	1	0	47	62	1.88	-1.56	.53	9	3	.0	0	7.3	W	26	W	8	9	4	18	6.4	59	133
Park Place	1932	------	------	69	48	58.4	----	85	17	36	14	0	0	--	--	1.40	-----	.35	9	1	.0	0	----	---	--	---	--	12	5	14	5.8	--	227
Philadelphia CO	26	------	------	74	55	64.3	+1.4	91	16	47	14	1	0	--	--	4.67	+1.41	1.82	8	4	T	0	7.7	---	23	E	17	9	7	15	6.2	62	85
Philadelphia	13	1011.5	1012.4	80	53	63.6	+1.5	90	17	43	14	2	0	48	62	4.00	+.74	2.05	9	5	.0	0	9.5	WSW	*23	NW	2	4	13	14	6.6	--	93
Pittsburgh CO	749	------	------	74	53	63.5	+.9	87	17	42	14	0	0	--	--	2.89	-.32	.86	11	--	.0	0	----	---	--	---	--	--	--	--	---	55	113
Pittsburgh	1248	983.1	1013.6	73	52	62.2	+2.0	85	17	41	7	0	0	47	62	2.06	-1.15	.58	10	5	T	0	8.7	WNW	31	W	27	8	12	11	6.0	49	140
Reading CO	266	1000.7	1012.2	75	53	63.6	+1.7	91	17	41	14	1	0	--	--	1.92	-1.75	.90	12	5	.0	0	9.3	---	38	W	27	7	8	16	6.2	61	99
Scranton CO	746	983.7	1012.5	72	50	60.6	+1.2	88	16	34	14	0	0	--	--	1.60	-1.67	.58	10	5	.0	0	6.2	---	26	NW	2	11	10	10	5.5	61	166
Williamsport	527	993.9	1012.8	74	48	61.0	+.3	89	16	34	14	0	0	45	60	2.01	-1.57	.70	7	3	.0	0	6.8	NW	*33	W	12	6	13	12	6.0	--	151
RHODE ISLAND																																	
Block Island	110	1008.1	------	63	49	56.2	+3.4	77	31	39	5	0	0	--	--	3.28	-.20	.91	9	2	.0	0	----	---	--	---	--	6	13	12	6.3	--	269
Providence CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	189
Providence	55	1006.1	1012.2	68	48	58.2	+2.0	89	16	35	5	0	0	45	78	4.50	+1.54	1.72	13	2	.0	0	9.3	SE	35	SW	9	7	14	10	6.1	70	223

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2–Continued

MAY 1951

State and station	Elevation (ground)	Pressure		Temperature								No. of days				Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)					
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft	Mb	Mb.	°F	°F	°F	°F	°F		°F				°F	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1012.5	1014.2	81	63	72.1	-0.6	92	22	57	8	2	0	--	--	0.98	-2.02	0.55	3	4	T	T	---	---	35	W	4	19	7	5	3.8	78	0
Charleston	41	1013.2	1014.7	83	57	69.9	-.3	95	22	46	8	3	0	58	65	.70	-2.92	.38	4	3	.0	0	8.6	W	--	---	-	15	10	6	4.2	--	6
Columbia CO	332	1001.7	------	83	58	70.7	-1.2	93	31	48	8	4	0	--	--	.13	-2.96	.13	1	-	.0	0	---	---	30	W	23	19	9	3	3.5	87	10
Columbia	217	1005.8	1014.0	85	55	70.3	----	98	22	43	8	7	0	52	56	.29	-----	.18	4	3	.0	0	7.3	WSW	--	---	--	20	8	3	3.2	--	10
Florence	146	1008.5	1013.9	84	56	70.0	----	96	22	48	°8	6	0	53	60	.56	-----	.18	9	5	.0	0	7.5	SW	--	---	--	16	11	4	4.1	--	5
Greenville	1006	977.3	1014.0	81	57	68.6	+1.4	91	22	46	7	2	0	49	54	.52	-3.51	.32	4	5	T	T	7.8	N	47	NW	7	13	12	6	4.4	81	20
Spartanburg	801	984.8	1014.5	81	56	68.4	-.6	91	22	47	13	2	0	50	55	.86	-2.74	.40	5	6	.0	0	8.4	W	*42	WSW	11	15	12	4	3.8	--	24
SOUTH DAKOTA																																	
Huron	1282	967.2	1014.0	70	46	58.1	+1.7	84	24	31	6	0	1	45	68	3.42	+.44	.90	13	6	T	T	11.4	S	57	NW	25	11	5	15	6.0	64	212
Rapid City	3215	901.5	1014.3	68	44	56.3	+2.3	89	28	31	7	0	1	38	57	1.87	-1.07	.39	11	9	T	T	11.5	NNW	49	S	12	4	11	16	6.7	48	276
Sioux Falls	1420	963.4	1014.5	70	48	58.7	0	82	24	32	11	0	1	47	70	4.37	+.64	1.91	14	8	T	0	10.9	NNE	*34	NW	26	9	7	15	6.2	--	193
TENNESSEE																																	
Bristol	1519	961.1	1015.1	76	50	62.8	-2.1	86	1	38	8	0	0	51	69	4.81	+.72	.96	14	11	.0	0	6.1	SW	--	---	--	12	12	7	4.7	--	106
Chattanooga	670	987.5	1015.0	83	53	67.8	+2.3	95	31	40	8	7	0	53	64	1.50	-2.29	.79	6	7	.0	0	5.3	NE	63	NW	2	15	14	2	3.6	81	46
Knoxville	949	980.4	1015.0	80	54	67.0	+.3	91	1	42	8	4	0	52	64	1.29	-2.46	.47	8	6	T	T	8.1	SW	49	W	4	12	12	7	4.5	61	55
Memphis CO	----	------	------	--	---	----	----	--	--	--	--	-	---	--	--	----	-----	---	--	--	---	--	----	---	--	---	--	--	--	--	---	--	24
Memphis	263	1000.7	1015.0	84	57	70.5	+.7	97	30	44	8	8	0	53	57	1.88	-2.27	1.83	3	4	T	0	9.4	SSW	28	N	22	15	12	4	3.9	86	33
Nashville	577	995.3	1014.9	81	55	67.8	-.4	92	19	41	12	5	0	52	62	.83	-3.04	.57	7	7	T	0	6.8	S	39	SW	22	16	9	6	4.0	71	60
TEXAS																																	
Abilene	1752	952.6	1011.1	86	61	73.4	+2.8	102	29	48	2	11	0	53	59	4.38	+.42	2.18	5	7	T	T	15.1	SSE	54	N	24	12	8	11	4.9	63	7
Amarillo	3590	887.6	1010.9	78	52	64.9	+2.8	94	30	40	1	3	0	46	61	9.81	+7.02	6.75	10	11	T	T	15.0	SSE	49	W	31	8	12	11	5.4	60	98
Austin	515	992.2	1013.3	86	64	74.9	+.3	95	29	51	2	9	0	63	72	3.51	-1.13	1.03	10	8	T	T	9.3	SE	32	NW	24	6	16	9	5.8	53	3
Big Spring	2533	923.8	1010.8	87	61	74.0	+1.8	103	29	40	7	12	0	49	52	1.61	-.91	.84	7	10	T	0	17.1	S	--	---	--	14	9	8	4.6	--	15
Brownsville	16	1009.5	1011.4	86	72	79.0	+.4	91	5	64	26	4	0	70	81	2.37	-.21	1.51	4	3	.0	0	14.4	SE	36	N	25	6	13	12	6.2	51	0
Corpus Christi	40	1012.2	1012.7	86	70	77.9	+3.4	93	28	63	1	4	0	70	84	.95	2.27	.49	8	5	.0	0	14.1	SE	54	SE	11	5	16	10	6.2	69	0
Dallas	487	995.6	1013.5	83	62	72.7	-.2	98	29	53	8	5	0	58	66	4.57	+.09	1.16	10	8	T	0	12.1	SSE	32	S	31	16	6	9	4.6	66	5
Del Rio CO	957	973.9	1010.2	90	67	78.3	+1.3	100	5	55	2	17	0	61	64	2.15	-.73	1.70	9	9	.0	0	11.6	ESE	52	NW	24	9	11	11	5.6	68	0
El Paso	3920	878.8	1007.1	88	58	73.1	+3.1	104	28	38	1	11	0	30	25	T	-.33	T	0	2	.0	0	11.2	WSW	47	NW	24	18	7	6	3.3	85	27
Fort Worth	688	990.2	1013.8	84	61	72.6	+.4	99	29	52	7	9	0	56	62	4.60	-.05	1.53	11	7	T	0	13.6	SE	38	N	9	14	7	10	4.7	--	5
Galveston CO	7	------	------	80	71	75.2	+.4	88	4	61	7	0	0	--	--	2.86	-.56	1.72	7	--	.0	0	13.3	---	36	SE	14	--	--	--	---	70	0
Galveston	7	1014.2	1014.4	81	71	75.6	+.8	87	4	62	7	0	0	69	83	2.50	-.92	1.15	7	5	.0	0	14.2	SSE	--	--	--	13	8	10	4.9	--	0
Houston CO	41	976.0	------	85	68	76.2	+.7	92	10	59	8	9	0	--	--	1.90	-2.60	.66	7	5	.0	0	11.1	---	35	SE	15	9	11	11	5.8	69	0
Houston	41	1012.2	1014.3	85	65	75.0	+1.0	94	29	59	7	7	0	66	80	3.32	-.78	1.58	9	7	.0	0	13.3	SSE	--	---	--	7	12	12	6.3	--	0
Laredo	500	996.3	1012.1	92	70	80.9	-.1	100	29	60	8	18	0	68	74	1.88	-1.86	1.57	5	7	.0	0	15.2	SE	--	---	--	8	9	14	5.8	--	0
Lubbock	3238	900.8	1009.9	83	54	68.5	+.8	100	29	39	3	7	0	48	57	2.63	+.09	1.93	8	8	T	0	17.0	S	48	N	9	13	8	10	4.7	--	49
Palestine CO	491	996.6	1014.6	82	63	72.5	-.2	92	29	52	2	5	0	--	--	2.58	-1.96	1.16	9	5	T	T	18.0	---	29	S	5	13	10	8	5.1	73	4
Port Arthur CO	5	1013.2	------	83	69	75.9	+.7	90	27	63	11	1	0	--	--	1.61	-2.51	.68	7	6	.0	0	13.3	---	36	SE	1	13	8	10	5.0	78	0
Port Arthur	5	1013.9	1014.4	84	64	74.0	----	91	28	56	13	4	0	66	81	1.94	-----	.90	11	7	.0	0	10.3	S	--	---	--	10	10	11	5.3	--	0
San Angelo	1903	945.5	1010.9	88	62	75.3	+2.3	102	29	48	2	14	0	53	55	1.11	-2.07	.47	6	6	.0	0	14.3	SSE	*38	SE	15	12	9	10	5.0	--	5
San Antonio	782	988.5	1012.6	86	65	75.4	+.3	94	6	50	2	9	0	63	73	4.44	+1.24	1.94	10	9	.0	0	10.4	SE	39	E	15	5	16	10	5.9	50	2
Victoria	109	1009.1	1013.1	86	68	76.9	+.3	95	4	59	1	9	0	67	80	7.48	+3.40	5.36	11	6	.0	0	8.8	SE	*36	NNW	1	4	17	10	6.5	--	0
Waco	504	993.9	1012.2	84	63	73.8	-1.1	95	29	53	2	7	0	61	69	3.35	-1.21	.73	10	11	.0	0	11.5	SE	--	---	--	11	10	10	5.2	--	4
Wichita Falls	1027	976.6	1012.2	82	60	71.2	-1.1	100	29	51	11	4	0	56	65	5.42	+.80	3.28	9	8	T	T	12.6	SE	46	NE	6	15	6	10	4.7	--	10
UTAH																																	
Milford	5029	844.2	1012.2	72	42	56.9	+.1	92	27	26	2	2	4	33	49	1.58	+.94	.54	5	3	T	0	9.2	SSW	--	---	--	9	12	10	5.6	--	264
Salt Lake City CO	4260	------	------	--	--	----	----	---	--	--	--	--	--	--	-	----	----	----	--	--	---	--	----	---	--	---	--	--	--	--	---	--	180
Salt Lake City	4222	868.6	1011.3	71	47	59.0	+3.3	93	27	32	13	1	1	40	54	.87	-.90	.33	9	7	T	0	7.6	SSE	42	N	11	8	10	13	5.8	67	198
VERMONT																																	
Burlington	398	997.3	1012.0	67	45	56.0	-.5	85	26	29	5	0	2	44	66	1.63	-1.22	.53	12	0	.0	0	9.0	N	*31	SE	27	10	7	14	6.0	53	302
VIRGINIA																																	
Cape Henry CO	16	1011.9	1012.5	72	57	64.7	+.5	91	23	48	15	1	0	--	--	2.67	-.90	1.59	10	4	.0	0	----	---	38	NW	24	13	9	9	4.7	76	62
Lynchburg	947	980.0	1013.6	76	53	64.4	-1.5	90	2	45	6	1	0	50	63	2.08	-1.55	.88	11	6	T	0	8.5	N	37	N	4	12	8	11	5.2	63	82
Norfolk CO	11	1009.8	------	76	58	66.6	+.4	91	23	51	7	1	0	--	--	3.68	-.13	1.56	11	6	T	T	----	---	33	W	23	--	--	--	---	73	45
Norfolk	25	1012.2	1013.4	75	55	64.6	+.4	91	23	47	15	1	0	53	69	2.95	-.86	1.27	7	6	.0	0	9.2	NE	--	---	--	12	7	12	5.2	--	67
Richmond CO	162	------	------	77	54	65.3	-1.2	89	2	45	13	0	0	--	--	3.03	-.76	1.25	9	--	.3	T	----	---	--	---	--	--	--	--	---	--	59
Richmond	160	1007.1	1013.1	77	52	64.6	-.7	89	22	43	13	0	0	52	67	2.51	-----	1.15	8	5	T	T	7.3	WSW	33	N	23	8	10	13	6.2	69	76
Roanoke	1192	972.2	1013.9	77	52	64.3	-.8	90	2	43	13	1	0	50	64	1.27	-2.11	.32	11	7	.0	0	7.0	NW	--	---	--	12	6	13	5.1	--	73
Washington CO	72	------	------	76	54	65.2	+1.5	90	17	45	14	2	0	--	--	3.23	-.47	1.62	9	3	.0	0	----	---	28	W	27	--	--	--	---	57	68
Wash. Nat'l AP	14	1009.1	1013.1	75	55	64.9	+1.2	89	16	47	14	0	0	51	64	2.74	-.96	1.23	8	3	T	T	8.3	NW	34	WNW	27	10	9	12	5.9	58	68
WASHINGTON																																	
Ellensburg	1727	953.6	1016.0	68	41	54.8	-.7	85	22	33	5	0	0	39	57	1.28	+.69	.81	6	3	.0	0	15.9	NW	--	---	--	10	14	7	5.4	--	310
Kelso	17	------	------	67	42	54.6	----	85	21	35	2	0	0	--	--	2.32	-----	.82	11	0	.0	0	----	---	--	---	--	6	7	18	7.1	--	315
North Head CO	194	1011.2	1019.0	57	47	52.2	+1.3	62	5	44	1	0	0	--	--	1.81	-1.14	.46	14	0	T	T	14.4	---	46	S	22	1	12	18	7.3	46	391
Olympia	190	1010.8	1018.2	66	41	53.6	----	86	22	31	1	0	1	44	71	1.91	-----	.72	11	0	T	T	4.7	S	--	---	--	5	12	14	6.5	--	345
Port Angeles	11	1017.6	1018.8	57	46	51.5	----	64	3	40	1	0	0	45	80	1.58	-----	.85	10	0	.0	0	13.3	W	--	---	--	5	14	12	6.7	--	413
Seattle	14	1017.3	1018.4	--	--	----	----	--	--	--	--	--	--	44	68	----	-----	----	--	--	---	--	8.0	NNW	--	---	--	--	--	--	---	--	---
Seattle CO	14	------	------	66	48	57.0	+.4	78	22	41	1	0	0	--	--	1.35	-.52	.39	12	2	T	0	8.6	---	34	SW	23	10	8	13	6.3	67	244
Spokane	2357	946.2	1015.3	67	42	54.5	-1.0	86	22	34	29	0	0	37	54	.66	-.76	.19	7	0	.0	0	8.8	SW	34	SW	23	4	17	10	6.2	53	321
Stampede Pass CO	3960	880.1	1019.2	51	35	43.0	----	75	22	27	1	0	12	--	--	5.37	-----	1.69	16	1	2.7	63	12.7	---	43	---	28	6	8	17	7.0	--	676
Stevenson CO	319	------	------	65	46	55.6	----	83	22	39	29	0	0	--	--	2.01	-----	.62	15	2	.0	0	----	---	--	---	--	3	11	17	7.5	--	286
Tacoma CO	127	1011.2	1018.0	64	47	55.4	+1.3	83	22	40	29	0	0	--	--	1.07	-1.05	.33	9	0	T	0	7.2	---	28	SW	°22	11	13	7	5.1	62	291
Tatoosh CO	101	1015.6	1018.9	56	47	51.3	+1.7	65	3	40	1	0	0	47	85	1.70	-2.30	.39	14	0	T	0	11.0	W	66	S	23	1	11	19	8.0	40	417
Walla Walla	1200	------	------	--	--	----	----	--	--	--	--	--	--	43	--	----	-----	----	--	--	---	--	8.7	S	--	---	--	--	--	--	---	--	---
Walla Walla CO	949	979.7	1015.2	72	49	60.6	+1.0	93	22	41	29	1	0	--	--	.56	-1.05	.39	4	2	.0	0	6.0	---	23	SW	°1	12	9	10	5.0	72	152
Yakima	1061	976.3	1015.2	74	41	57.2	-1.0	91	22	29	1	1	4	36	48	.81	+.36	.77	4	3	.0	0	8.4	W	--	---	--	11	12	8	5.4	--	240
Seattle-Tacoma CO	379	1004.1	1018.3	65	44	54.2	----	81	22	32	1	0	1	44	71	1.61	-----	.63	12	4	T	0	9.7	SW	--	---	--	6	10	15	6.6	--	326
WEST VIRGINIA																																	
Charleston	950	979.0	1014.3	78	51	64.3	----	89	18	39	24	0	0	51	68	4.64	-----	1.09	14	13	T	0	7.6	SW	*44	W	26	10	13	8	5.1	--	95
Elkins	1969	945.8	1014.4	71	46	58.7	+1.0	83	17	34	14	0	0	49	74	3.75	-.30	.84	13	8	.0	0	5.3	WNW	42	SW	27	6	12	13	6.5	57	199
Huntington	565	------	------	81	52	66.4	+4.0	91	1	41	24	4	0	--	--	4.86	+.79	1.42	14	--	.0	0	----	---	--	---	--	--	--	--	---	--	56
Parkersburg CO	615	------	------	77	53	64.9	+1.1	89	17	42	13	0	0	--	--	2.85	-.53	.75	13	9	.0	0	5.7	---	31	NW	27	9	10	12	5.4	72	84
Parkersburg	837	------	1013.6	--	--	----	----	--	--	--	--	--	--	51	--	----	-----	----	--	--	---	--	6.9	SW	--	---	--	--	--	--	---	--	---
Petersburg	1013	977.0	------	75	49	61.8	----	87	17	36	14	0	0	--	--	3.22	-----	1.08	10	5	T	T	----	---	--	---	--	10	7	14	6.3	--	126
WISCONSIN																																	
Green Bay	689	988.5	1014.2	69	47	57.7	+2.8	83	15	32	13	0	1	47	69	.89	-2.63	.25	10	3	.0	0	14.3	NE	56	SW	14	6	13	12	6.2	64	234
La Crosse CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	-----	----	--	--	---	--	----	---	--	---	--	--	--	--	---	--	109
La Crosse	669	989.2	1013.7	73	53	63.2	+5.3	86	1	36	11	0	0	49	65	3.37	-1.38	1.34	9	5	.0	0	10.3	S	*37	NW	27	8	8	15	6.6	--	113
Madison CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	-----	----	--	--	---	--	----	---	--	---	--	--	--	--	---	--	170
Madison	857	983.1	1014.6	73	49	60.9	+3.3	87	16	36	13	0	0	49	69	3.00	-.85	.72	12	3	.0	0	11.5	W	38	W	26	9	10	12	6.0	59	170
Milwaukee CO	----	------	------	--	--	----	----	--	--	--	--	--	--	--	--	----	-----	----	--	--	---	--	----	---	--	---	--	--	--	--	---	--	256
Milwaukee	674	988.8	1014.1	68	48	57.9	+5.3	86	16	38	13	0	0	47	72	3.87	+.52	.96	10	3	T	T	11.5	NNE	36	S	14	8	12	11	6.0	59	240

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

MAY 1951

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
WYOMING																																	
Casper	5322	835.8	1012.0	65	41	53.0	-1.4	83	27	30	7	0	2	35	56	1.45	-0.75	0.59	12	8	T	T	10.2	E	--	---	--	6	7	18	6.8	--	369
Cheyenne	6139	810.4	1012.6	63	39	51.2	+.9	83	28	30	6	0	2	36	63	2.77	+.34	1.22	12	6	T	0	13.6	W	69	NW	25	1	12	18	7.5	62	422
Lander	5563	833.7	1013.3	65	40	52.1	+.9	83	27	30	2	0	5	33	54	4.37	+2.11	1.95	10	5	4.2	4	7.5	---	40	W	24	7	7	17	6.5	63	393
Rock Springs	6741	793.1	1013.8	63	38	50.5	-.7	79	27	27	2	0	7	32	55	.65	-.32	.42	9	7	T	T	13.7	W	*45	NE	°15	6	7	18	7.0	--	443
Sheridan	3942	882.8	1013.4	69	42	55.4	+3.4	88	23	31	14	0	1	35	51	.93	-1.72	.20	8	4	T	T	9.5	NW	54	NW	25	3	16	12	6.4	66	296
PACIFIC AREA																																	
Canton Island	9	1009.8	1010.3	92	79	85.2	----	97	9	75	11	24	0	75	79	5.36	-----	1.38	16	1	.0	0	----	---	--	---	--	5	17	9	6.3	--	0
Hilo	28	1015.9	1017.4	81	65	73.2	----	84	1	62	25	0	0	65	76	3.76	-----	.67	26	0	.0	0	5.6	SW	22	SE	°24	0	20	11	6.9	33	0
Honolulu CO	12	------	------	80	71	75.4	+.6	82	15	68	15	0	0	--	--	.36	-1.38	.10	9	-	.0	0	----	---	--	---	--	-	--	--	---	--	0
Honolulu	7	1017.3	1017.9	83	70	76.5	----	84	13	67	14	0	0	64	68	.23	-----	.13	6	0	.0	0	10.5	ENE	29	NE	17	17	9	5	4.2	67	0
Lihue	115	1012.9	1017.9	82	70	75.8	----	83	1	63	7	0	0	66	73	.77	-----	.29	12	0	.0	0	9.5	ENE	24	E	°4	6	21	4	5.1	67	0
Wake Island	9	1015.9	1016.3	85	76	80.2	----	87	31	72	5	0	0	72	78	1.66	-----	.49	13	0	.0	0	13.2	E	--	---	--	9	18	4	4.9	--	0
WEST INDIES																																	
San Juan, P.R. CO	47	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	-	--	-	----	---	--	---	--	--	--	--	---	--	.0
San Juan, P.R.	9	1012.2	1014.9	87	74	80.8	----	92	°5	68	1	8	0	73	79	6.33	-----	1.65	14	12	T	T	10.0	E	30	E	19	5	14	12	6.6	64	0
ALASKA																																	
Anchorage	134	1009.5	1014.6	57	37	46.9	+1.9	68	31	28	°2	0	7	35	63	.05	-.45	.03	2	0	.0	0	6.3	NW	26	S	19	5	7	19	7.1	51	554
Annette Island	110	1013.4	1017.6	54	43	48.3	-1.6	67	6	37	3	0	0	42	82	4.66	+.06	1.38	21	0	T	0	8.8	NW	*31	SE	20	1	5	25	9.0	--	509
Barrow	22	1022.0	1022.4	24	14	18.9	-.5	34	7	8	°14	0	31	16	88	.01	-.13	.01	1	0	.1	12	12.7	SE	26	SE	°2	2	4	25	8.7	--	1422
Bethel	21	1008.5	1009.8	53	36	44.5	+4.5	66	12	25	1	0	8	37	77	2.25	+1.37	.83	17	0	T	T	8.4	ESE	*22	SE	°2	3	4	24	8.7	--	628
Cordova	40	1013.9	1015.9	51	34	42.3	-1.0	54	6	25	3	0	16	38	85	5.86	-1.28	2.38	20	0	T	2	3.1	SW	--	---	--	5	4	22	8.2	--	896
Fairbanks	436	995.6	1012.9	63	36	49.3	+2.7	77	31	28	3	3	8	33	57	.44	-.33	.19	7	0	T	0	6.9	N	42	SE	20	9	9	13	5.5	57	479
Galena	94	1006.4	1011.2	59	37	47.5	+5.3	72	31	28	14	1	8	36	60	.93	-.16	.43	7	1	.0	0	9.0	NNE	--	---	--	9	7	15	5.7	--	537
Gambell	25	1012.5	1013.5	34	27	30.2	+.9	44	31	14	1	0	--	28	91	1.10	+.49	----	11	--	9.8	--	17.0	NE	42	E	2	1	5	25	9.0	--	2262
Juneau	15	1015.8	1016.7	55	39	46.8	.0	65	31	28	2	0	3	40	80	2.12	-8.30	.43	17	0	.0	0	6.1	E	30	SE	°20	1	6	24	8.7	27	555
Kotzebue	10	1014.6	1015.2	41	29	34.8	+5.2	62	29	17	1	0	25	29	84	.15	-.19	.07	5	0	T	T	8.8	WNW	--	---	--	11	8	12	5.4	--	928
McGrath	334	999.0	1011.9	60	36	48.1	+4.8	73	31	28	5	1	5	34	63	.72	-.26	.45	5	1	T	T	4.3	N	--	---	--	5	10	16	6.8	--	519
Nome	13	1012.5	1013.2	47	33	40.1	+6.0	60	31	19	1	0	14	35	82	.40	-.24	.27	7	0	.6	5	10.1	NNE	32	SE	5	8	8	15	6.1	--	765
Northway	1713	950.2	1013.5	59	34	46.6	+1.3	68	6	21	2	0	11	31	59	.95	+.22	.50	6	2	1.8	4	3.8	NW	--	---	--	2	10	19	7.6	--	564
St. Paul Island	22	1006.0	1007.1	41	32	36.6	+1.6	46	19	24	25	0	16	34	87	.80	-.64	.41	8	0	T	T	----	---	--	---	--	5	3	23	8.1	--	873
Umiat	337	1009.5	1022.7	34	19	26.3	+4.9	55	31	9	14	0	31	21	82	T	-.10	T	0	0	T	5	11.0	E	--	---	--	6	11	14	6.7	--	1773
Wales	9	1014.6	1014.9	33	25	29.1	+2.4	45	30	18	1	0	29	26	85	.05	-.44	.03	2	0	.4	21	----	---	--	---	--	1	5	25	8.7	--	1104
Yakutat	28	1015.8	1017.0	50	36	43.0	-.8	63	7	29	°1	0	7	40	87	2.82	-4.86	.89	12	0	T	5	6.1	W	*31	ESE	21	2	6	23	8.7	--	675

Data from airport unless otherwise specified. CO indicates data from city office.

* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

° Other dates also.

DEGREE DAYS

(Base 65°F.)

Table 3

MAY 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	39	2906	2610
Mobile (CO)	2	1691	1566
Mobile	2	1777	
Montgomery (CO)	2	2173	2071
Montgomery	4	2335	2071
ARIZONA			
Flagstaff	443	6579	7051
Payson (CO)	182	3471	
Phoenix (CO)	15	1019	1441
Phoenix	16	1145	
Prescott	184	3911	
Tucson	25	1419	
Winslow	143	4114	
Yuma	2	640	1036
ARKANSAS			
Ft. Smith	21	3478	3225
Little Rock	18	3186	3008
Texarkana	7	2637	
CALIFORNIA			
Bakersfield	37	1767	
Beaumont (CO)	159	2439	
Bishop	109	3572	
Blue Canyon	400	5115	
Burbank	72	1460	
Eureka (CO)	367	4129	4451
Fresno	56	2254	2399
Los Angeles (CO)	69	1124	1364
Los Angeles	137	1639	
Mt. Shasta (CO)	364	5332	
Oakland	162	2545	
Red Bluff	79	2504	2644
Sacramento (CO)	80	2307	2659
Sacramento	87	2460	
Sandberg (CO)	256	3720	
San Diego	79	1222	1547
San Francisco (CO)	240	2839	2940
San Francisco	216	2821	
San Jose	106	3136	
Santa Catalina	254	2134	
Santa Maria	233	2520	
COLORADO			
Alamosa	431	7965	
Colorado Springs	290	6275	
Denver	248	5819	5775
Grand Junction	151	5261	
Pueblo	175	5462	5529
CONNECTICUT			
Bridgeport	175	5179	
Hartford	179	5507	6066
New Haven	202	5336	5833
DELAWARE			
Wilmington	125	4971	
DIST. OF COLUMBIA			
Washington (CO)	68	4079	4547
Washington	68	4100	
FLORIDA			
Apalachicola	0	1442	1252
Daytona Beach	0	1083	
Fort Myers	0	491	
Jacksonville (CO)	0	1261	1185
Jacksonville	0	1380	
Key West (CO)	0	85	59
Key West	0	104	
Melbourne	0	699	
Miami (CO)	0	299	185
Miami Beach	0	168	
Int. Airport, Hialeah	[illegible]	254	
Orlando	0	796	
Pensacola (CO)	1	1531	1281
Tallahassee	0	1616	
Tampa	0	673	571
West Palm Beach	0	317	
GEORGIA			
Albany	0	1961	1651
Atlanta (CO)	33	3129	2983
Atlanta	19	2987	
Athens	20	3112	
Augusta	12	2637	2305
Columbus	[illegible]	2555	
Macon	5	2324	2337
Rome	45	3429	
Savannah	[illegible]	2045	1635
Valdosta	0	1781	
IDAHO			
Boise	254	5394	5586
Lewiston	226	5026	
Pocatello	279	6389	6576
ILLINOIS			
Cairo (CO)	30	4110	3953
Chicago (CO)	186	6202	6215
Chicago	165	6586	
Chicago University	205	6429	
Joliet	165	6060	
Moline	132	6841	
Peoria	123	6431	5976
Springfield (CO)	67	5668	5430
Springfield	105	6054	
INDIANA			
Evansville	74	4974	4404
Ft. Wayne	174	6447	6191
Indianapolis (CO)	89	5571	5436
INDIANA (Cont'd.)			
Indianapolis	113	5949	
South Bend	198	6635	
Terre Haute	112	5826	
IOWA			
Burlington	121	6654	
Charles City (CO)	131	8172	7562
Davenport (CO)	115	6602	6223
Des Moines	115	6924	6529
Dubuque	173	7385	6779
Keokuk (CO)	121	6301	5645
Sioux City	134	7268	6865
KANSAS			
Concordia (CO)	83	5495	5407
Dodge City	102	5098	5049
Goodland	199	6017	
Topeka (CO)	59	5136	5062
Topeka	86	5381	
Wichita	69	4762	4635
KENTUCKY			
Lexington	89	5054	4778
Louisville (CO)	65	4624	4409
Louisville	68	4778	
Pikeville (CO)	58	3939	
LOUISIANA			
Baton Rouge	0	1690	1508
Lake Charles	0	1554	
New Orleans (CO)	0	1226	1203
New Orleans	1	1392	
Int. Airport, Moisant	0	1431	
Shreveport	4	2258	2132
MAINE			
Caribou	448	8875	
Eastport	472	7078	8144
Greenville (CO)	445	8616	9245
Portland	347	6824	7241
MARYLAND			
Baltimore (CO)	74	4134	4475
Baltimore	101	4595	
Frederick	118	4868	
MASSACHUSETTS			
Boston	215	5073	5870
Milton	294	6079	
Nantucket	331	5271	5754
Pittsfield	304	7068	
MICHIGAN			
Alpena (CO)	330	7766	8110
Detroit	192	6300	6504
Escanaba (CO)	345	8512	8607
Grand Rapids (CO)	171	6378	6645
Grand Rapids	202	6828	
Lansing	209	6934	
Marquette (CO)	365	8551	8525
Muskegon	236	6945	
Sault Ste. Marie	363	8899	9092
Ypsilanti	173	6447	
MINNESOTA			
Duluth (CO)	411	9918	9489
Duluth	368	10248	
International Falls	320	10824	
Minneapolis	132	8460	7904
Rochester	158	8740	
St. Cloud	190	9400	8774
St. Paul	124	8431	
MISSISSIPPI			
Jackson	3	2300	2162
Meridian	11	2448	2329
Vicksburg	6	2211	2069
MISSOURI			
Columbia	76	5405	5056
Kansas City	55	5124	4950
St. Joseph	75	5682	
St. Louis (CO)	55	4973	4588
St. Louis	58	5138	
Springfield	97	4863	4557
MONTANA			
Billings	249	7430	7107
Butte	556	9698	
Glasgow (CO)	243	9639	
Great Falls	365	7997	
Havre (CO)	275	8805	8283
Helena	394	8430	7738
Kalispell	433	7903	7812
Missoula	408	7666	7425
NEBRASKA			
Grand Island	145	6458	
Lincoln (CO)	95	6151	5955
Lincoln	120	6473	
Norfolk	149	7076	
North Platte	207	6470	6335
Omaha	94	6537	6071
Valentine (CO)	255	7306	7123
NEVADA			
Elko	396	6500	
Ely	449	6846	
Las Vegas	33	2244	2619
Reno	348	5361	5528
Tonopah			5730
Winnemucca	334	5722	6243
NEW HAMPSHIRE			
Concord	294	6717	7300
NEW HAMPSHIRE (Cont'd.)			
Mt. Washington	931	12572	
NEW JERSEY			
Atlantic City	139	4416	4978
Newark	116	4769	5471
Trenton	124	4793	5231
NEW MEXICO			
Albuquerque	81	3766	4512
Clayton	175	4957	
Roswell	42	3339	3576
Raton	298	5983	
NEW YORK			
Albany	220	6455	6602
Bear Mountain (CO)	231	6192	
Binghampton (CO)	222	6247	6744
Binghampton	269	6637	
Buffalo	246	6381	6835
New York (CO)	121	4591	5250
La Guardia Field	108	4468	
Oswego	302	6499	
Rochester	237	6450	6701
Schenectady (CO)	204	6297	
Syracuse	249	6538	6823
NORTH CAROLINA			
Asheville (CO)	104	4220	4221
Asheville	141	4543	
Charlotte	29	3291	
Greensboro	49	3940	
Hatteras (CO)	17	2537	2553
Raleigh (CO)	29	3202	3269
Raleigh	41	3483	
Wilmington (CO)	[illegible]	2415	2419
Winston-Salem	46	3771	
NORTH DAKOTA			
Bismarck	257	9861	8828
Devils Lake (CO)	255	10522	9959
Fargo	203	9778	
Grand Forks	234	10096	9748
Williston (CO)	278	9869	9171
OHIO			
Akron	198	6485	
Cincinnati (CO)	66	4756	4974
Cincinnati	100	5423	
Cleveland (CO)	187	5828	6088
Cleveland	168	5994	
Columbus	119	5773	
Dayton	127	5981	5389
Sandusky (CO)	168	5854	6053
Toledo	180	6382	6222
Youngstown	193	6438	
OKLAHOMA			
Oklahoma City (CO)	27	3529	3667
Oklahoma City	32	3666	
Tulsa	35	3742	
OREGON			
Baker (CO)	384	6533	6980
Baker	374	6858	
Burns (CO)	355	6483	
Eugene	265	4217	
Meacham	505	7268	
Medford	211	4137	4576
Pendleton	209	5036	
Portland (CO)	207	3943	4245
Portland	253	4346	
Roseburg (CO)	203	3656	4221
Salem	281	4406	
Sexton Summit (CO)	482	5837	
Troutdale	233	4388	
PENNSYLVANIA			
Allentown	153	5590	
Curwensville	270	7246	
Erie (CO)	224	5890	6295
Harrisburg	133	5240	5389
Park Place	227	6659	
Philadelphia (CO)	85	4366	4722
Philadelphia	93	4555	
Pittsburgh (CO)	113	5106	5322
Pittsburgh	140	5582	5633
Reading (CO)	99	4829	5209
Scranton (CO)	166	5701	6167
Williamsport	151	5906	5995
RHODE ISLAND			
Block Island	269	5047	5789
Providence (CO)	189	4934	5924
Providence	223	5310	
SOUTH CAROLINA			
Charleston (CO)	0	2031	1866
Charleston	6	2290	
Columbia (CO)	10	2548	2487
Columbia	10	2747	
Florence	5	2671	
Greenville	20	3284	3058
Spartanburg	24	3280	
SOUTH DAKOTA			
Huron	212	8358	7870
Pierre	177	7635	7231
Rapid City	276	7405	7088
Sioux Falls	193	8097	
TENNESSEE			
Bristol	106	4419	
Chattanooga	46	3423	3237
Knoxville	55	3751	3655
Memphis	33	3384	3089
Nashville	60	3987	3610
TEXAS			
Abilene	7	2491	2572
Amarillo	96	4071	4185
Austin	3	1601	1679
Big Spring	15	2535	
Brownsville	0	625	628
Corpus Christi	0	904	965
Dallas	5	2298	2367
Del Rio (CO)	0	1391	1501
El Paso	27	2373	2531
Fort Worth	5	2328	2354
Galveston (CO)	0	1115	1174
Galveston	0	1151	
Houston (CO)	0	1206	
Houston	0	1363	1315
Laredo	0	839	
Lubbock	49	3557	
Palestine (CO)	4	1962	2068
Port Arthur (CO)	0	1296	1352
Port Arthur	0	1511	
San Angelo	5	2227	
San Antonio	2	1564	1435
Victoria	0	1104	
Waco	4	1999	
Wichita Falls	10	2987	
UTAH			
Milford	262	5840	
Salt Lake City (CO)	180	5002	5591
Salt Lake City	198	5353	6049
VERMONT			
Burlington	302	7166	7945
VIRGINIA			
Cape Henry	62	3395	3532
Lynchburg	82	4312	4056
Norfolk (CO)	45	3144	3359
Norfolk	67	3460	
Richmond (CO)	59	3751	3914
Richmond	76	3923	
Roanoke	73	4341	
WASHINGTON			
Ellensburg	310	6695	
Kelso	315	4846	
North Head (CO)	391	5059	5055
Olympia	345	5236	
Port Angeles	413	5591	
Seattle (CO)	244	4229	4655
Seattle	326	5185	
Spokane	321	6405	6200
Stampede Pass (CO)	676	8745	
Stevenson (CO)	286	4851	
Tacoma (CO)	291	4677	4868
Tatoosh Island (CO)	417	5583	5507
Walla Walla (CO)	152	4573	4854
Yakima	240	5832	5525
WEST VIRGINIA			
Charleston	95	4447	
Elkins	199	5860	5742
Huntington	56	4132	
Parkersburg (CO)	84	4877	4910
Petersburg	126	5051	
WISCONSIN			
Green Bay	234	8547	7840
La Crosse (CO)	109	7691	7369
La Crosse	113	8175	
Madison (CO)	170	7609	7339
Madison	170	7818	
Milwaukee (CO)	256	7207	6977
Milwaukee	240	7457	
WYOMINA			
Casper	369	7393	
Cheyenne	422	7292	7371
Lander	393	7483	8088
Rock Springs (CO)	385	7099	
Rock Springs	443	7808	
Sheridan	296	7497	
ALASKA			
Anchorage	554	11443	
Annette Island	509	7279	
Barrow	1422	18822	
Bethel	628	12488	
Cordova	696	10245	
Fairbanks	479	14585	
Galena	537	14728	
Gambell	1262	13746	
Juneau	555	9394	
Kotzebue	928	14832	
McGrath	519	14094	
Nome	765	13143	
Northway	564	15810	
St. Paul	873	9995	
Yakutat	675	9412	
Umiat	1773	19823	
Wales	1104	14523	

Data from airport unless otherwise specified. CO indicates data from city office.

SEVERE STORMS

Table 4

MAY 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Carroll County (eastern section), Mo.	1	Afternoon					Small		Wind	Small buildings, poultry, and livestock affected.
Marshall County, Iowa	1	4:15 p.m.					$22,400		do	Damage to farm buildings in vicinity of Green Mountain and Gilman; brooder house with 360 chickens destroyed.
Grundy County, Iowa	1	5:15 p.m.					50,000		do	Damage to farm buildings in Colfax, Pleasant Valley, Beaver, and Lincoln Townships.
Floyd County, Iowa	1	6 p.m.					See remarks		do	Damage mainly to farm buildings in vicinity of Rockford.
Minnesota, extreme southeastern counties	1	P.m.					3,000		Wind and rain	A barn moved from its foundation; several small farm outbuildings blown over or otherwise damaged; plate glass and other windows broken; power lines down; hangar and two airplanes within damaged; roofs damaged; some trees uprooted. Heavy rains accompanied storm in places and caused additional damage.
Lincoln, Mont.	1						See remarks		Snow	Knocked out power and telephone lines, and blocked roads.
Whitefish, Mont.	1						See remarks		do	Power and telephone lines, and shade trees broken. Much fallen timber.
Livingston, Tenn.	1				1				Electrical	Girl, member of 4-H Club, killed by lightning.
Whittle Springs Golf Course, Knoxville, Tenn.	2	5:30 p.m.			1				do	Man, T. V. A. employee, killed by lightning.
Spartanburg, S. C.	2	5:39 p.m.						$5,000	Hail	
Shawnee County, Kans.	2	7:30 p.m.	10	**50	0	0	100		Tornadoes	Occurred 6 miles west and 1 south of Topeka Post Office. Funnel cloud observed for some distance and distinct roar and whistle heard. Several other embryonic funnels seen. Small damage to porch and old shed. Funnels moved northeastward. Some indication of tornadic winds 9 miles north of Topeka.
Atchison County, Kans.	2	8:30 p.m.			0	0	200		Tornado	Damage occurred 8 miles south of Effingham, where several farm buildings blown over. Distinct roar of tornado heard. Clouds moved northward.
Shawnee County, Kans.	2	9:30 p.m.			0	0	0	0	do	Funnel not seen, but roar and whistle distinctly heard. Sound moved from northward, but cloud did not come to ground. Occurred 8 miles east of Topeka Post Office, near AT&SF tracks and south bank of Kansas River.
Wood County, W. Va.	2	Evening			1		1,500		Electrical with winds	Man touched electric fence on farm near Waverly and was killed. It is believed that lightning had struck the wires. At Lauckport, wind caused damage at $1,500 to framework of church under construction. In Parkersburg, high winds damaged street lights, power lines, and trees.
Southeastern Maine, southern New Hampshire, Massachusetts, Rhode Island, and Connecticut	2, 9, and 16						See remarks	See remarks	Forest and brushland fires	Sunshine, with dessicating winds and record low humidity (as low as 8 percent at Boston on 2d) produced a state of high fire hazard. Dozens of fires on these dates in all States, except Vermont. Burned areas 100 to 5,000 acres, latter area being in Exeter, N.H. and West Greenwich, R.I.
Fowlerville, Mich.	3	2:30 p.m.	150	1½	0	0	175,000	0	Tornado	Occurred 2 miles east of Fowlerville, destroying 5 large barns, 3 garages, and utility lines; also, injured cattle and killed a few chickens.
Winnsboro, S. C.	3	Afternoon						3,000	Hail	
Dillon, S. C.	3	Afternoon					4,000	5,000	Wind	Damage near Hamer and Union Communities.
Columbus, Ind.	3	Afternoon				3	50,000		do	Large circus tent blown down and severely damaged. Trees blown down on cars and houses; television antennae blown down.
Amelia County, Va.	3	3:25-3:35 p.m.	*1	28				7,000+	Hail and wind	Hail damaged small grains, beat down plant beds, and damaged pastures and hay in a strip from northwest corner to southeast corner of County. Many trees felled by wind in southeast end of County.
Montgomery, Ala.	3	4 p.m.				1	5,000		Thundersquall	One person suffered cuts on head, shoulders, and ankle as she was blown against a glass door. Two planes damaged at Maxwell Field and 1 plane overturned at Allenport.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Louisville, Ky.	3	4 p.m.				2	$38,000		Wind and fire	Trees and windows broken; trash littered streets and yards; utility services interrupted; 2 planes damaged. Wind caused a fire to spread rapidly, causing about $28,000 damages. Peak gust 55 m.p.h.
Henrico County (especially at Richmond and vicinity), Va.	3	4–4:15 p.m.	•1	14		1	100,000	$102,000	Hail and wind	Damage in area parallel to Route 5, about 4 miles each side of route through County. Heads of small grains cut off; foliage beat off hay crops and pastures; buildings completely demolished; livestock injured and killed; trees and shrubs uprooted. One man seriously injured when a barn blew over. Interruption of electric service to Richmond, East Richmond, Sandston, and Ashland was severest experienced in several years. One roof ripped off in South Richmond housing unit. Fallen trees blocked traffic in some sections.
Burgin, Ky.	3	4–5 p.m.					500		Wind	Buildings damaged by falling trees; some barns partly unroofed.
Dinwiddie County, Va.	3	4:30–4:45 p.m.	1,360	20			150	7,500	Hail	Hail damaged rye, barley, and tobacco plant beds in a narrow strip north to south about middle of County. Some window panes broken.
Southampton County, Va.	3	4:30–6 p.m.	•2	20			1,000	10,000	Hail and wind	Storm uprooted trees, beat and cut crops so that they had to be replanted, and unroofed homes in Capron and Newsoms Magistrate District.
Mt. Pleasant, Pa.	3	Daytime			1				Electrical	High school soft ball player, standing at plate with bat in hand, killed when struck by bolt of lightning. Sky almost cloudless at time and not raining.
Rock Hill, S.C.	3	7:15 p.m.			1				do	Man killed by lightning.
Birmingham, Ala.	3	P.m.				3	250,000		Thundersquall	Trees uprooted with 50 falling upon automobiles. Plate glass windows broken in several downtown stores. Two airplane hangers demolished at Roberts Field and several planes damaged.
Butler County Ala.	3	P.m.					20,000		do	
Concord, Ga.	4	1:30–1:45 p.m.	880	3–4			200	5,000	Hail and wind	Hail, ranging in size up to 3/8 inch in diameter, heavily damaged a peach orchard, but other crops not affected. High winds blew down several telegraph poles and a number of trees. Storm moved eastward.
Cook County, Ga.	4	3–4 p.m.					500	100,000	do	Hail occurred extensively in area, 15x17 miles, with heaviest losses in Sparks and Riverbend districts. Size of hail as large as hens' eggs in some sections. Principal crops affected were tobacco, corn, tomatoes, and cotton. High winds damaged a few house roofs, and combination of hail and wind knocked out numerous window panes.
Knoxville Municipal Airport, Alcoa, Tenn.	4								Thunderstorm	Sixty m.p.h. wind with gusts to 80 m.p.h. recorded at airport.
Big Stone Gap (near), Va.	6	Evening			1				Electrical	Man killed by lightning while standing in doorway of home.
Belfield, N.D.	6						5,000		Wind	Some farm buildings damaged.
Ft. Bridger, Wyo.	7	12:25 p.m.			0	0	0	0	Tornado	No damage resulted as funnel failed to reach the ground.
Gray County, Kans.	8	Afternoon						See remarks	Hail	Principal damage to some remaining wheat fields south of Haggard.
Wichita County, Kans.	8	6 p.m.			0	0	300	0	Tornado	A baby tornado skipped about the area 6 miles south of Selkirk, but hit only one farm, damaging some new sheep sheds. Tornado accompanied by duststorm.
Barton County, Kans.	8	Late evening					See remarks		Winds	High winds stirred up considerable dust over county and part of roof of KVGB radio transmitter house torn off, 5 miles south of Great Bend.
Jefferson County, Kans.	9	7 a.m.		3	0	0	250	0	Tornado	Small buildings and farm machinery turned over 1½ miles southwest of Valley Falls. Some trees twisted.
Leavenworth County, Kans.	9	8:30 a.m.					1,000		Wind	Most damage in southern part of Leavenworth, where large trees and branches blown onto power and telephone lines, breaking wires and knocking out transformers.
Marion County, Kans.	9	Early morning					12,500		Electrical	Lightning struck the music hall of Tabor College in Hillsboro, resulting in its entire destruction by fire.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kiowa County (10 miles southeast of Hobart), Okla.	9	4 p.m.			1				Electrical	Farmer on tractor killed by lightning.
Sumner County, Kans.	9	4-5 p.m.		32			Small	$40,000	Hail	Heavy hail fell at intervals across southern Sumner County south and east of Caldwell and south of Ashton. Most damage to crops, but some windows and roofs also damaged. Storm moved eastward.
Caddo County (2 miles east of Ft. Cobb), Okla.	9	4-6 p.m.		1				1,000	do	Small hailstones drifted about 1 inch deep on ground. Some damage to wheat and cotton.
Grant County (near Renfrow and Wakita), and Kay County (north of Braman), Okla.	9	4:15-5 p.m.	•3 to 4	10			$1,000	130,000	do	Hail damage to wheat crop 50 to 100 percent. Hail crop damage in Grant County $50,000; hail crop damage in Kay County $80,000; property damage to roofs in Kay County $1,000; included in total.
Iowa Park and Wichita Falls, Wichita County, Tex.	9	5 p.m.	•5	12	0	1	See remarks		Tornado, wind and hail	Storm moved east-northeastward. Estimate of damage impossible, but $200,000 in Iowa Park alone. Wind and hail damage 95 percent; tornado damage 5 percent.
Sanford, Fla.	9	6-8:30 p.m.	•10				2,000	See remarks	Hail, rain and electrical	Affected Seminole County from town of Paola eastward to St. Johns River beyond town of Geneva. Storm moved eastward, accompanied by winds of 40 to 50 m.p.h. in gusts. Hail light and stones averaged 1/4 inch. Major damage to sweetcorn, electrical power, and White Way light. A 2,400 volt generator set afire by lightning in City Water Plant.
Walters (7 miles north and 1 mile west of), Cotton County, Okla.	9	6:30 p.m.	Narrow	Short	0	0	1,000	0	Tornado	One farmstead damaged.
Kingfisher County (west and northwest of town of Kingfisher), Okla.	9	6:30-7 p.m.	•2 to 3	10				10,000	Hail	Hail damage to wheat in fields about 20 percent over area.
Bryan, Marshall, and Johnston Counties, Okla.	9	8:20 p.m.	100	15	0	1	40,000	0	Tornado	Path north-northeastward from western Bryan County through Cumberland Oil Field area in eastern Marshall County, to Nida and Kenefick areas in southern Johnston County. Ten cottages in Cumberland Oil Field area badly damaged. At Nida, high school auditorium unroofed during commencement exercises.
Adair (near), Mayes County, Okla.	9	9 p.m.					10,000		Electrical	Farm home struck by lightning.
Osage County, Kans.	9	9 p.m.			0	0	See remarks		Tornado	Embryonic tornado passed over Overbrook. Roar distinctly heard. A number of trees damaged.
Inez, Ky.	10	7:30-9 p.m.					500	See remarks	Wind	Power service affected. Trees blown down, and fruit trees damaged. Window panes broken.
Upper Sandusky, Ohio	11	7:45 a.m.					50	500	Hail	Principal damage to window glass, trees, and growing crops, principally garden.
New Orleans, La.	11	9:30 a.m.					25,000		Electrical and wind	Airplanes damaged at New Orleans Airport. Garages blown down in Gentilly sections. Several buildings, including brewery, struck by lightning.
Derry (near), Pa.	11	1 p.m.					See remarks	See remarks	Hail, winds and electrical	Hailstones as big as hens' eggs wrecked roofs, damaged autos, broke hundreds of windows, and damaged fruit trees and crops. Lightning disabled refrigerator. High winds damaged trees.
Frederick and Clark Counties, Va.	11	1:30-5 p.m.	•1	Several			1,000	100,000	Hail	Damage to apple and peach orchards, gardens, and windows in southern sections of counties from Cedar Creek to White Post.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Uniontown (near), Pa.	11	2 p.m.					See remarks		Hail, rain, and electrical	New Salem section hardest hit. Hail size of eggs and golf balls, drifted more than 12 inches deep, with some stones 4 inches in circumference. Hundreds of windows broken, auto tops dented, and roofs, trees, gardens, and crops damaged by hail. Lightning stunned a cow, and set a haystack afire. Heavy rain inundated low-lying fields, and rising waters caused evacuation of home at Fordyce.
Louisville, Ky.	11	2-2:30 p.m.			0				Tornado	Tornado cloud observed northeast of city, but apparently did not touch ground.
Mathias and vicinity, W. Va.	11	Early afternoon					$2,000	$2,000	Hail	Light damage to early vegetables and heavy damage to corn fields, requiring replanting; some damage to fruits. Considerable damage to poultry, especially to young turkeys just put out on range.
Madison, Fla.	11	Afternoon						Minor	Hail	
Cambria, Somerset, Indiana, Bedford, and Blair Counties, Pa.	11	Afternoon			0	1	See remarks		Tornado, winds, hail, and rain	Tornado damage heaviest near Friedens, where barn and silo demolished. Barn roof landed on car, crushing it, a few seconds after tornado had picked up driver and carried him about 20 feet through the air. Treetops twisted and torn above 15 feet height for nearly 7 miles through Canoe Creek valley. Other farm buildings, trees, and wires damaged along hit-skip path of tornado from west of Sipesville to east of Friedens. High winds elsewhere in area caused minor damage, and local, heavy rains caused washouts in cultivated fields.
King and Queen County, Va.	11	Late afternoon			0	0	See remarks		Tornado	Outhouses and a barn demolished. Roofs and chimneys torn from houses in Shackleford's section, and telephone service in three counties disrupted.
Bedford County, Va.	11	4-4:20 p.m.	440	4			200	1,400	Hail and wind	Gardens, corn, and fruit damaged. One wall blown down. A few trees broken in Hickory Grove neighborhood.
Richmond and vicinity, Va.	11	4:45-5 p.m.	*1	8		1	25,000	25,000	Hail, wind and electrical	Woman injured when lighting struck chimney of her home, causing her to fall down a flight of stairs. Window breakage by hail severest in years. Lightning struck at least four dwellings. Crops in Chesterfield and Henrico Counties, principally broad-leaf garden vegetables, suffered much damage.
Fairfax County, Va.	11	5:30-8 p.m.					3,000	1,000	Electrical and hail	Lightning and ensuing fire damaged one house to extent of $2,000. Broken glass and damage to automobiles and airplanes by hail estimated at $1,000.
Smithfield (near), Va.	11	8-10 p.m.	150				12,000	0	Wind	Principal damage to two farms about 2 miles south of Smithfield where chicken houses and other buildings blown down, metal roofing ripped from large barn, and large trees blown down. In other places throughout Isle of Wight County, trees, chimneys, and outbuildings blown down.
Ebony, Brunswick County, Va.	11	P.m.				1			Electrical	Woman seriously injured when struck by lightning while hanging out clothes.
Dunbar, W. Va.	11	Evening					See remarks		Wind	Canvas roof of skating rink collapsed in 70 m.p.h. wind when four center poles snapped.
Danville, Va.	11				1				Rain	Boy taking refuge in culvert from heavy rain storm drowned by rush of water.
Louisville, Ky.	11				1	1			Rain and hail	Downpour flooded streets and underpasses and slowed traffic. Hail accompanied rain in some areas.
Bowman, N. Dak.	12	8:30 p.m.	*10	20	0	0	30,000	7,000	Wind (possibly a tornado)	Buildings damaged; windows broken; small frame buildings destroyed or moved; a few quonset buildings destroyed; some farm machinery damaged. Damage to growing crops; some damage to stored grain.
Sunlersville, Md.	12		*1	2				3,000	Hail	A brief hailstorm made an accumulation of 3 inches on the ground in some places. Many new crops damaged.
Perkins County (eastern portion), Nebr.	13	1-3 p.m.	*5	20				See remarks	do	Wheat, gardens, and flowers pounded into ground by hailstones up to walnut size.
Guymon and Goodwell areas, Texas County, Okla.	13	6:25-6:45 p.m.	*3	10			1,000	5,000	do	

See footnotes at end of table.

SEVERE STORMS

Table 4—Continued

MAY 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Finney County, Kans.	13	7 p.m.					$10,000		Hail and rain	Hail accompanying a driving rainstorm battered cars, windows, and trees. Many neon signs put out of use.
Cloud County, Kans.	13	11 p.m.					6,000		Electrical	Large farm home 5 miles northwest of Jamestown burned completely.
Anselmo (7 miles southwest of), Custer County, Nebr.	13	Evening			0	0	2,000		Tornado	Farm property damaged. Porch of house destroyed, smaller farm buildings damaged or blown down, and wind mill blown over.
Norton County, Kans.	13	Night					500		Wind	Several farm buildings damaged northwest of Lenora. May have been an incipient tornado.
Ellis County, Kans.	13	Night			0	0	800		Tornado	A small tornado developing out of severe wind and heavy rain struck a house in northwestern Ellis County, lifting roof from house.
Decatur County, Kans.	13	Night					1,000		Wind	Composition roof on Norcatur High School, in east-central part of county, torn off.
Rooks County, Kans.	14	11:30 a.m.					500		do	Roof of one farm house 5 miles south of Plainville blown off. Some evidence of a "twister".
Kansas, extreme western counties	14	Afternoon and evening			0	4	85,150		Tornadoes, wind and hail	Two squall lines extending from south of Elkhart in Oklahoma north to Nebraska line produced a number of individual damaging storms. One series began about 2:30 p.m., 15 miles northwest of Tribune and progressed almost north to near Bird City by 7:30 p.m. It damaged property in northwestern Greeley County near Sharon Springs and at Wallace in southeastern Sherman County about 5:30 p.m., near Brewster at 6:30 p.m., and 2 miles east of McDonald about 7:30 p.m. Second squall line extended from south of Elkhart in Oklahoma northward toward Stanton and Hamilton Counties, striking near Elkhart about 6:30 p.m. and Manter about 7:30 p.m. Four persons injured when tornado struck their car near McDonald. Four funnels reported near Elkhart, two near Brewster, and two near McDonald. Seven single tornadoes apparently occurred elsewhere in storm area. Intermittent hailstorms also reported. General direction of storms was northward, except northeastward from northwest Greeley County to southeast Sherman County. Heavy rains preceded and accompanied tornadic action.
Waynoka (near), Woods County, Okla.	14	6 p.m.			1	1			Electrical	Farmer killed by lightning; daughter knocked down.
Hooker and vicinity, Texas County, Okla.	14	9:15 p.m.	*1				500		Hail	Cars dented; roof damaged.
Texas County, Okla.	14		Narrow	Short	0	0	5,000		Tornadoes	Originated 6 to 8 miles south of Elkhart, Kans. Farm buildings destroyed; some livestock killed. Two tornadoes observed at one time moving northeastward in Texas County.
Baca, Prowers, Bent, Las Animas and eastern Otero Counties, Colo.	14-15	5 p.m., 14th-8a.m. 15th	*50	60	1		650,000	$350,000	Hail, wind, and rain	Severe thunderstorms moving northward caused heavy damage to crops, buildings, farm machinery, railroad and highway bridges, communication lines, and inundated many fields. Severe loss of cattle and sheep as result of high waters. Amounts up to 7 and 8 inches fell in Baca County. Holly worst hit of towns with 2 to 3 feet of water in main section; Wildhorse Creek overflowed its banks. Man killed in his home when flood waters rose so quickly he could not get out.
Cimarron County, Okla.	15	2-4 a.m.					1,000	0	Wind	Several barns and other buildings damaged throughout County, especially near Kenton.
Flagg, Castro County, Tex.	15	6:30 p.m.			0	0	See remarks		Tornado	Tornado moved northeastward. Outbuildings, barns, and windmills demolished on one farm.
Lynch, Boyd County, Nebr.	15				1				Electrical	Man instantly killed by lightning.
Erick (near), Beckham County, Okla.	16	10 a.m.	Narrow	Short	0	0	0	0	Tornado	Traveled across open field; caused no damage.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Anselmo, (15 miles west of), Custer County, Nebr.	16	3:30 p.m.			0	0	$ 0	$ 0	Tornado	Funnel did not reach ground as observed.
Blair and Martha (near), Jackson County, Okla.	16	8–8:15 p.m.	33	1½			8,400	5,000	Wind, hail, and electrical	Hail damage to cotton, $5,000; wind damage to buildings, $2,400; electrical damage, $6,000; included in total.
Comanche County, Kans.	16	11:45 p.m.					8,000		Electrical	Newly modernized farm home 7½ miles southeast of Coldwater destroyed by fire after being struck by lightning.
Franktown-Elizabeth, Colo.	17	5:35 p.m.			0	0	0	0	Tornado and thunderstorms	Sighted by airline pilots and on radar screen at Lowry Field Air Base. Traveled northwestwardly accompanied by quite severe thunderstorms.
Olney, Archer County, Tex.	18	3:45 p.m.	200		2	100	1,500,000		Tornado	Tornado moved eastward through center of town; 150 homes damaged.
Porter Hill and Elgin communities, Comanche County, Okla.	18	5:30–6 p.m.	Narrow	4	0	0	15,000	0	Tornadoes, rain and hail	Moved from Porter Hill eastward to Elgin. Three funnels observed at one time. Accompanied by heavy rain and some hail. Heavy rains of 4 to 6 inches occurred at Fletcher and Sterling to north and east of path. Many farmsteads damaged. Residences in Porter Hill and Elgin damaged.
Rush Springs area, Grady County, Okla.	18	6 p.m.					1,000	5,000	Hail and wind	Some hail as large as baseballs. Wind damage to plate glass windows.
Bridgeport and vicinity, Morrill County, Nebr.	18	7 p.m.					Slight		Hail	Light to heavy hail.
Minneapolis, St. Paul, and vicinity, Minn.	18	P.m.					4,500		Electrical and rain	Residence in St. Paul badly damaged by fire after being struck by lightning. A tall tree shattered, chimney damaged, and other minor damage occurred in a number of places from lightning. Heavy rains accompanied storm and caused additional damage.
St. Paul, Minn.	18	P.m.					15,000		Rains	Basements flooded; street pavings washed out; automobiles and street cars stalled; housing project damaged; lowlands inundated.
Ringwood, Helena, Aline, and Waynoka areas, Alfalfa, Major and Woods Counties, Okla.	19	4–5 p.m.	•1 to 2	10–12			32,000	10,000	Wind and hail	Extensive hail damage to crops. High wind damage to buildings.
Braman (north of), Kay County, Okla.	19	4:30–5 p.m.	•3	10				200,000	Hail	Hail damage to wheat, oats, and alfalfa 25 to 100 percent.
Roger Mills County, Okla.	19	5–6 p.m.	0	0	0	0	0	0	Tornadoes	Three different tornado clouds sighted, but did not come to ground.
Mayfield (near), Beckham County, Okla.	19	7:15–7:30 p.m.	Narrow		0	0	1,000	0	Tornado	Tornado moved southeastward over pasture land. One farm building destroyed.
Taloga (3 miles south of), Dewey County, Okla.	19	7:30 p.m.	70	2	0	0	2,600	1,000	do	One farmstead completely demolished; another farmstead damaged. Photo of member of family found 6 miles northeast of demolished house.
Las Cruces and vicinity, N.Mex.	19	7:30 p.m.						See remarks	Hail	Spotted damage to cotton and alfalfa in small areas.
Berlin (west of), Beckham County, Okla.	19	8:12 p.m.	220	Short	0	0	0	0	Tornado	Moved southeastward; lifted immediately after it hit ground.
Southern Kiowa and northern Jackson Counties, Okla.	19	9:30–10 p.m.					4,000	50,000	Hail and wind	Area of about 200,000 acres affected. High wind caused about $1,000 damage to barn at Experiment Farm 1 mile southwest of Altus Dam. Parts of barn scattered 1/4 mile to southwest. About $3,000 hail damage to windows and roofs in Snyder and Mountain Park.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cedar County (extreme south), Iowa	19	Midnight	440	2			See remarks		Wind	Damage largely limited to farm buildings about 3½ to 5 miles northeast of West Liberty.
Brown Airport, Tulsa County, Okla.	19-20	10 p.m.-1 a.m.	880				$5,000		Wind	Path northeastward. One plane demolished. High winds occurred in connection with thundersquall.
Big Springs, Deuel County, Nebr., extending also to Julesburg, Colo.	20	10 a.m.-2 p.m.	•12	14					Rain and hail	Rains in part of area reported unofficially 4 to 7 inches, as caught in buckets and cans.
					0	0	See remarks	See remarks	Rain, hail wind and tornado	Lowlands flooded, highway bridges over sand ditches lost, and many homes damaged in Big Springs. Water cover preceding hail protected from hail damage, but minor hail and wind damage occurred. Tornado cloud seen.
Roswell and vicinity, N. Mex.	20	1:25 p.m.	•1½	3			°500,000	°	Hail	Most of damage to buildings in city of Roswell. About 800 acres of cotton partially damaged.
Sedgwick County, Colo.	20	2 p.m.	•14	15	0	0	500,000	$250,000	Tornadoes, hail, and rains	Storm swept from a point north of Julesburg in an easterly direction to Big Springs, covering eastern half of Sedgwick County. Several small tornadoes observed with some damage to fences and small buildings. Most damage caused by heavy rain and consequent flooding in Julesburg where many basements were filled. Some damage to roads, and heavy washing of fields.
Perkins County (northwestern portion), Nebr.	20	2-4 p.m.					°12,000	°	Hail and flooding	Much damage to wheat, but no accurate estimate obtained.
Clermont, Fla.	20	3:30-4 p.m.	•2	10				See remarks	Hail	Storm moved northwestward. Diameter of hailstones [illegible] to 1½ inches. Hail damaged oranges and grapefruit, and scarred trees.
Hugo, Colo.	20	4 p.m.				1		3,000	Hail, rain and electrical	Hail and flood damage to crops. One man injured by lightning.
Las Cruces and vicinity, N.Mex.	20	4 p.m.						See remarks	Hail	Spotted damage to cotton and alfalfa in small areas.
Toccoa (2 miles west of), Ga.	20	4-4:30 p.m.	•1	10			0	5,000	do	Storm moved southeastward near Currahee Mountain. Hail, measuring up to size of birds' eggs, caused substantial damages to orchards, gardens, and other crops, and practically none to property.
Henderson County (Fruitland, Dana, and East Flat Rock sections), and Polk County (Saluda section), N. C.	20	4:30 p.m.	•2-4	10				50,000	Thunderstorm with hail	Storm originated near Fruitland, in Henderson County, and moved south-southeastward to near Saluda, in Polk County. Hailstones up to 3/4-inch in diameter. Most intense hail at Camp Bear Walla, where it was reported to have lasted 15 minutes and accumulated to a depth of 3 inches. After storm, ground in apple orchards completely covered with leaves, branches, and small apples. Apples suffered greatest damage, but some damage to strawberries and garden vegetables.
Allison Gap, Smythe County, Va.	20	4:45-5:20 p.m.	880	1				200	Hail	Gardens damaged extensively.
Morton County, Kans.	20	Afternoon						See remarks	Hail and wind	Storm moved northeastward over northeastern Morton County. Wheat losses up to 75 percent.
Kearny County, Kans.	20	7-7:30 p.m.	See remarks	See remarks	0	0	135,000	40,000	Tornadoes, hail, wind, and floods	Two tornado funnels distinctly seen and heard. One extended from 4 miles southeast of Lakin northeastward 12 miles. The other was 2 miles north of Lakin and traveled eastward about 1 mile. Houses, barns, government grain bins, etc. suffered damage. Path of damage ranged from 50 yards to 1 mile in width in longer storm. Hail covered a path ½ to1½ miles wide and 20 miles long eastward just north of Lakin. Stones varied in size up to that of soft balls. Pits left in soil where they struck. Crops, cars, glass, and roofs damaged. High winds within radius of 15 miles of Lakin contributed to damage. Of damage to property, $15,000 due to hail and $120,000 to tornadoes; $40,000 damage to crops by hail. Flooding from heavy rains and especially from overflow due to breaking of an irrigation ditch wall caused damage to almost every house in Lakin. Flood losses estimated at $100,000.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Phillips County, Kans.	20	8 p.m.	•3	20			$2,000	$20,000	Hail	Most damage to 900 acres of immature crops. Stones as large as hens' eggs. Storm moved southeastward across north-central part of county.
Ellis County, Kans.	20	Evening					Slight		Winds	Damage at Gala Gardens in Hays indicated some tornadic winds.
awlins County, Kans.	20	Evening			0	0	Slight		Tornadoes	Apparently several small funnels developed, but only one came to ground near McDonald, where a gasoline truck was picked up and set down again without harm.
Harlan County (southeastern portion from Alma eastward), Nebr.	20		•4 to 5	10				See remarks	Hail	Wheat and alfalfa damaged; wheat mostly a complete loss in strip.
Geary County, Kans.	21	1 a.m.			0	0	200		Tornado, winds, and rain	Tornadic wind with its accompanying roar tore roofing from two buildings on farm 7 miles west of Junction City. High winds and rain lashed Junction City and surrounding area.
McPherson County, Kans.	21	Early morning					3,500		Electrical	Seven hundred barrels of oil burned in fire started by lightning north of Inman.
Eldon (4 miles south of), Mo.	21	1:10 p.m.			1		0	0	do	Boy killed when struck by lightning.
Sumner County, Kans.	21	3:30 p.m.	•2	3			°15,000	°	Hail	Hail caused heavy damage to greenhouses, windows, neon signs, roofs, and gardens in Wellington; also, from 25 to 100 percent loss to wheat in area 2 miles wide extending 2 miles north of town and short distance south.
Orlando, Fla.	21	5 p.m.	440	••440			10,000	Minor	Wind and hail	Storm moved northeastward. It damaged roofs of house and barn; two windows blown out of another house; 40 percent of hangar roof torn off; two airplanes badly damaged, one slightly; fruit of orange grove scarred by hail. Wind estimated over 100 m.p.h.
Baca County, (southeastern portion), Colo.	21	5 p.m.	•6	3			200	1,500	Hail and rain	Severe hail and local flood damage. Hailstones ranged to size of golf balls.
Cowley County, Kans.	21	5 p.m.					1,000		Hail, wind, and rain	Damage in Arkansas City resulted from hail and strong wind to telephone and electric lines and to roofs. Heavy accompanying rain added to damage.
Neosho County, Kans.	21	6:30 p.m.					2,500		Electrical and hail	Large barn northeast of Erie containing some hay destroyed by fire after being struck by lightning. Slight hail damage northwest of Erie during same storm.
Stanton, Grant, Haskell, and Meade Counties, Kans.	21	7 p.m.	•3	80	0	0	4,000	300,000	Hail and tornado	Hail caused extensive damage at numerous locations along a narrow path extending from south of Johnson, in Stanton County, to northern Meade County. Among areas hardest hit were: South and east of Johnson, south of Big Bow, from Sublette to several miles north, and in vicinities of Plains and Meade. Wheat losses ranged upward to 100 percent. One small tornado observed south of Johnson, where it dipped into a farmyard and pulled stucco from corner of house.
McRae, White County, Ark.	22	3:30 p.m.	•1½	6			35,000	See remarks	Hail and wind	Storm originated about 2 miles to the west of McRae, moved eastward over town, and continued eastward. Hailstones averaged 1 inch in diameter, with some reaching 3 inches. Extensive damage to roofs, windows, gardens, and crops. Many chickens killed. Young crops in fields and remainder of strawberry crop destroyed. Damage to crops in White County extensive.
Augusta, Woodruff County, Ark.	22	10 p.m.	100				1,000	See remarks	do	Storm progressed north-northeastward, striking west edge of Augusta. Some damage to roofs, windows, and automobiles. A number of power lines broken. Gardens suffered considerable damage, and some cotton hit.
Greenfield, Ind.	22	Afternoon					10,000		Wind	Two barns and a garage destroyed; one new car and several buildings damaged.
Knightstown and Carthage areas, Ind.	22	Afternoon and evening					30,000	5,000	do	Barns demolished or unroofed, trees blown down, and windows blown out.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Louisville, Ky.	22	7 p.m.					$5,000		Electrical	Utilities suffered most damages when heavy duty lines of electric company struck by lightning. Winds up to 67 m.p.h. in gusts.
Richmond, Va.	23	1:15-1:40 p.m.					15,000		Electrical and wind	Roofs ripped from several buildings and homes in mid-town. Number of trees knocked over; utility service disrupted in some areas.
Washington (Mount Rainier area), D.C.	23	1:30-5:30 p.m					2,000		Electrical	House damaged by lightning and ensuing fire.
Quincy, Fla.	23	2-3 and 5-6 p.m.	•10	15				See remarks	Wind and hail	Storm scattered around Quincy area. Hail ranged from small to size of golf balls. Principal damage t tobacco shades and tobacco.
Greenville, Fla.	23	2:45 p.m.	•60	15			1,000	Minor	Wind	Two houses blown down at Ebb, 10 miles south of Greenville. Trees, lights and telephone poles blown down at Greenville.
Virginia, Northern Neck area	23	Afternoon					200	$20,000	Hail and wind	Damage considerable to small grain, corn, tomatoes, in Northumberland, Lancaster, Richmond, and Westmoreland Counties.
Waynesville to Middletown, Ohio	23	Afternoon	•2	10			125,000	300,000	Thunderstorm, wind, rain, and hail	Wind, hail, and rain damage general over area. Damage figures quoted are for this storm plus a second which struck on May 26 in same general area. County Agent commented as follows: "... everything that was up was hurt bad, especially hay, wheat, and corn."
Baltimore, Md.	23	5 p.m.			1		See remarks		Electrical and rain	Traffic clogged on streets and scores of cellars flooded. A square block in Dundalk area under water when a storm sewer failed. A city employee struck and killed by lightning as he stood near a large, metal crane.
St. Augustine, Fla.	23	5:30-6:30 p.m.							Wind and hail	Wind estimated about 45 m.p.h. Hail size of marbles.
Colquitt County (northern portion), Ga.	23		Narrow	10	0	0	600	15,000	Tornado	Began at New Elm community, dipping and rising along a 10-mile path, and ending near Norman Park, direction of movement east. A tobacco barn and several other small houses demolished, a small truck damaged, wire fences badly twisted, and communication lines and trees blown down. Crops along path of storm badly damaged.
Sanford, Fla.	24	4:10-5:15 a.m.					2,500	Minor	Wind	High winds blew down two large trees; one disrupted telephone service, another fell against side of house. Chimney blown off another house. Numerous small signs blown down.
Newport (Harbor), R. I.	24	7:45 a.m.			19				Northeast gales and heavy seas	A 50-foot Navy launch capsized. Reported by witness that wind was 20 to 30 knots, and waves 15 feet high. Of about 142 men aboard, 19 were drowned.
Rochester, Haskell County, Tex.	24	5 p.m.	•10	10	1	0	See remarks		Tornado, hail, and electrical	Tornado moved east-southeastward; destroyed a small house. Lightning burned a farm home. One death attributed to lightning. Hail killed chickens. High water filled cellars and entered homes and business houses.
Abilene, Tex.	24	6 p.m.			2		800,000	25,000	Hail	Storm covered city of Abilene, 25 square miles.
Red Willow County (northeast of McCook)			•2	6				30,000	Hail	Loss of wheat and oats up to 80 percent in some localities.
and southeastern and extreme northern Furnas County, Nebr.	24	8:30-10:30 p.m.						See remarks	Hail and wind	Severe damage to crops north of Arapahoe and southeast of Beaver City; mainly small grains and alfalfa.
Marshall County, Kans.	24	Night						See remarks	Hail	Hail in vicinity of Herkimer, 5 miles northwest of Marysville, damaged crops to the extent of 50 percent or more on some farms.
Cloud County, Kans.	25	2:30 p.m.		3	0	0	1,000		Hail and tornado	Heavy hail in parts of Concordia and to east of town damaged windows, neon signs, fruit trees, and wheat in a few areas. Tornado 12 miles southeast of Concordia dipped on farm, unroofing a cow shed, and demolishing chicken house.
Washington County, Kans.	25	3:15 p.m.			0	0	0	0	Tornado	Small funnel sighted near Haddam, but did not come to ground.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Clay County, Kans.	25	4 p.m.	•4	8	1	0	$61,000	$22,000	Hail and tornado	Hail extending from southeast of Idana eastward about 8 miles to a point 7 miles southeast of Clay Center did considerable damage to wheat. Tornado originating in southwest corner of hail area near Ladysmith moved northeastward for 3 to 3½ miles in path 1/4 mile wide, dipping several times to wreck farm buildings, damage cars, and kill checkens on at least 4 farms. Man with heart ailment died during storm. Property damage by tornado, $60,000; hail, $1,000. Crop damage by tornado, $6,000; by hail, $16,000.
Geary County, Kans.	25	4:20 p.m.	•2	8			40,000	5,000	Hail	Junction City center of heavy hailstorm which did extensive damage to roofs, windows, neon signs, automobiles, greenhouses, and gardens. Some wheat north of town damaged 30 to 50 percent.
Marshall County, Kans.	25	Afternoon					500		Electrical	Farm home near Summerfield, 15 miles northeast of Marysville, struck by lightning. Large hole burned in roof and all of roof weakened.
Republic County, Kans.	25	Late afternoon			0	0	2,000		Tornado and hail	Small tornado wrecked farm buildings and overturned machinery on farm 2 miles south of Narka. Hail covered ground.
Chase County, Kans.	25	5:30–6 p.m.	•3	13				15,000	Hail	Hail in 3-mile strip from 8 miles north of Saffordville to 5 miles south produced up to 60 or 70 percent wheat losses.
Burlington Junction, Mo.	25	Night			0	0	1,500		Tornado	Thirty hogs killed and 40 others injured.
Osceola (near), Iowa	25				1				Electrical	Clarke County farmer killed by lightning while discing.
Carrabelle, Fla.	26	10:15–11 a.m.	•5		3	0	75,000	Minor	Tornado	Damaged buildings, boats, and commercial fishing equipment. Storm moved northeastward. Three fishermen drowned. Twenty families affected.
Brentwood (3 miles south of), Williamson County, Tenn.	26	1 p.m.					2,500	500	Wind	Huge oak trees split, hundreds of branches hurled across farms, and scattered farm equipment blown over several acres.
Lake City, Fla.	26	1:23–3:36 p.m.			0	0	See remarks		Tornado	Roofs torn off two houses. A small house blown off its foundation.
Waynesville to Middletown, Ohio	26	Afternoon	•2	10			See remarks	See remarks	Wind	Considerable property damage and extensive tree breakage. See remarks on storm of May 23 in same area.
Monterey, Tenn.	26								Hail and winds	Hail and high winds caused damage to trees.
Lawrenceburg, Ind.	26						75,000		Wind and electrical	Overhead pipeline felled by wind and lightning at Seagram Distillery, with heavy damage.
Missouri, northeastern and east-central portions	26–27	All day					Considerable	0	Wind	Damage in St. Louis area totaled near $25,000; remainder of damage unassessable.
Menard, Sangamon, Morgan, Cass, Christian, and Shelby Counties, Ill.	26–27						°100,000	°	Winds, with squall line and hail	Thunderstorms late on 26th resulted in some hail damage to crops in Menard County. Other damage resulted largely from falling trees and limbs and was confined to damage to wires, houses, and parked cars.
Henderson, Ky.	26–27							1,000	Wind	Damage mostly to crops and fruit trees.
Missouri, southeastern portion	27	9 a.m.–5 p.m.					Small	590,000	Sand	Greatest damage along sand ridge of Dunklin County, from Malden to Hornersville. In some fields damage as high as 75 percent of cotton planted. In New Madrid County losses of cotton estimated at $60,000; soybeans and corn up to $30,000; most damage in northern part of county. Minor damage in Pemiscot County.
Norman and vicinity, Cleveland County, Okla.	27	11 a.m.–12 noon	880	5			3 600	4,000	Wind and hail	Property damage by high wind. Crop damage by hail.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
East of Yukon, near Lake Overholser, Bethany, and area west of Oklahoma City, Canadian and Oklahoma Counties, Okla.	27	12 noon-12:30 p.m.	*6	12			$64,000	$11,000	Wind and hail	Three farms in Canadian County, east of Yukon, suffered $10,000 wind damage and $20,000 hail damage to crops. Severe damage by hail to crops and gardens in entire area. Scattered wind damage over an area about 3 miles wide and 12 miles long. Damages estimated as follows: hail to crops, $10,000; hail to roofs, etc., $4,000. High wind to crops, $1,000; high wind to property, $60,000; included in totals.
Harding County (northeastern portion), N. Mex.	27	5:30 p.m.					See remarks		Hail	Some windows broken and roofs damaged.
Idaho, from Adams, Washington and Payette Counties eastward to Camas and Blaine Counties	27	Afternoon and evening						See remarks	do	Hail, mostly small, reported at a dozen stations. Damage principally to gardens.
Wayne and Washington communities, McClain County, Okla.	27		*6	6				16,000	do	All cotton destroyed, and most corn damaged over most of area.
South Acton, Mass.	28	6:43 a.m.					10,000		Electrical	Lightning struck and burned dwelling to extent of $10,000 damage. Wire services of town and of the Boston and Maine Railroad signal system out of operation for several hours.
Rock Springs, Wyo.	28	1:15 p.m.						600	Hail	Damage confined to trees, shrubs, and neon signs.
Sidney, Mont.	28						See remarks	See remarks	Wind	Winds of 60 to 75 m.p.h. caused some crop and property damage.
Van Hook, N.D.	28						10,000		do	Some buildings destroyed.
Parshal, N.D.	28						500		Hail	Hail, size of marbles, covered ground. A few windshields broken, but too early for crop damage.
Kit Carson, Cheyenne, and Lincoln Counties, Colo.	29	4-10 p.m.	*8-10	100			55,000	85,000	Hail and winds	Several hailstorms, moderate to heavy, moved in east-southeasterly direction through counties indicated. Principal damage to winter wheat, with property losses confined to roofs, glass, and automobiles.
Fort Meade, Md.	29	12:30 p.m.			1	3			Electrical	Lightning struck and killed a soldier in his pup tent, shocking three other soldiers in the tent.
Ocean City (5 miles northwest of and extending to Ocean City), N.J.	29	P.m.	800				10,000		Hail	Main damage on one large truck farm. Thirty acres of lettuce ready to harvest destroyed, also 15 acres of cantaloupes, 15 acres of cabbage and 5 acres of squash. Two smaller growers nearby also had crops damaged. Hail mostly size of peas, reported 5 inches deep over large farm. Hail 2 inches deep in Ocean City.
Wallace, Greeley, Wichita, Scott, Kearny, and Finney Counties, Kans.	29-30	10:30 p.m.-1:20a.m.	*2-15	100			2,625,000	3,590,000	Hail and wind	Storm began near Kit Carson, Colo., and moved eastward, striking southern Wallace County and northern three-fourths of Greeley County. Over Greeley County it apparently split, one arm extending eastward across Wichita and Scott Counties to about 6 miles southeast of Scott City. The other arm reached southeastward across southern Wichita, northern Kearny, and central Finney Counties to about 12 miles southeast of Garden City. Hurricane force winds from west and northwest drove hailstones, ranging in size from small peas to "too large to go into a gallon can", against all objects in storm path. Hail fell only 10 or 15 minutes at most places, but generally followed by heavy rain. At a new farm home in northern Kearny County, a hailstone came through the north window, glanced on living room floor, and broke a pane in the south window, but was stopped by glass in storm sash. Property damage included shredded roofs, broken windows in homes and stores, automobiles dented, farm machinery battered, stucco pounded from houses, holes battered in sides of buildings, 60,000 acres of irrigated wheat lost in a 500-mile area west of Garden City,

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										$50,000 neon sign destruction, and losses due to sheep, pigs, and chickens being killed. Some cattle found bleeding the next day. One insurance company had 3,000 claims covering losses on everything. About 1,300 cars dented and had glass broken, and 4,500 dwellings damaged.
Western Morrill County and eastern Scottsbluff County, Nebr.	30	2-3 p.m.	•1-2	20-30	0	5	$400,000	$100,000	Tornadoes, thunderstorm and hail	Two or more tornadoes with thunderstorm. Farm buildings damaged east of Scottsbluff; automobiles, buildings, and telephone power lines damaged at Bayard, where roofs of sugar warehouse and seed warehouse suffered much damage and a hatchery destroyed. Gas mains in Bayard broken when trees uprooted. Hail damage in Morrill County.
Garden County (along north side of Platte Valley), Nebr.	30	3-5 p.m.	•15	30			16,000	50,000	Wind and hail	Buildings and trees overturned.
Chase County (east-central portion), Nebr.	30	5 p.m.	800	18	0	0	122,500	60,500	Hail and tornado	Winter wheat loss about 60 percent. Many buildings and considerable poultry lost.
Stevens, Grant, and Haskell Counties, Kans.	30	Late afternoon					25,000		Wind	Severe wind, first reported as causing minor damage to Hugoton Airport only, actually damaged it to the extent of $25,000 and later destroyed a granary and moved machinery at a farm in southern Grant County, then severely damaged a hangar at Satanta Airport, in Haskell County.
Seward County, Kans.	30	6:30 p.m.					5,000		do	Two boiler smokestacks 125 feet high toppled from their bases. Loss included stacks, damage to roofs, and loss of operating time at North Natural Gas Company 20 miles north of Liberal.
Wellfleet (vicinity of Lincoln County), Nebr.	30	7:30-9:30 p.m.	•1	7			See remarks	See remarks	Rains	Rains around 3.50 inches. Corn washed out, with erosion damage in fields, and fences lost. $5,000 damage reported to railraod engine, and a box car junked. A farmer 2 miles east of Wellfleet lost 1,500 young turkeys.
Clay, Riley, Geary, Pottawatomie, and Jackson Counties, Kans.	30	10-11:45 p.m.		90	0	0	9,000		Tornadoes and winds	A series of incipient tornadoes followed a path from central Clay County eastward to central Jackson County. Funnel clouds not seen due to darkness, but damages indicated tornadic winds at following locations: 3 miles west and 2 north of Clay Center, 6 miles south and 2 west of Wakefield, 4 miles east of Wakefield, 2 miles east and 2 south of Broughton, 1 mile north of Rocky Ford, 1 to 3 miles southwest of Westmoreland, 5 miles eastward from Westmoreland, 16 miles west and 5 miles south of Holton, and north edge of Holton. Residences, barns, sheds, and light and telephone lines damaged to some extent along path. Possibly 8 tornadoes occurred.
Ellis County, Kans.	30	Evening			0	0	5,000		Tornado and wind	Buildings damaged and some livestock killed when small tornado struck a farm plant near Munjor, 4 miles southeast of Hays. High winds over much of County broke trees and raised sufficient dust to interfere with traffic. Some minor damage to buildings.
Meade County, Kans.	30	Evening					500		Electrical	Lightning struck wind charger on milk house at one farm about 10 miles east of Meade, resulting in fire which consumed building and contents.
Russell County, Kans.	30	Evening					4,000		Wind	A brief but furious wind hit Memorial Park at Russell just after evening performance of Prairiesta, a celebration of city's 80's anniversary, got under way. Program broken up and stage properties demolished.
Smith County, Kans.	30	Night					500		Wind, rain, and hail	Severe windstorm accompanied by rain and hail caused slight damage near Lebanon. Winds with some tornadic characteristics blew down chicken house and ripped roof off brooder house on farm south of town.
Marion County, Kans.	30	Night					750		Electrical	Barn on farm 3 miles southwest of Lincolnville destroyed by fire caused by lightning.
Russell County, Kans.	30	Night					1,200		do	Lightning in Wilson burned out a generator on one of city's new engines, as well as damaging wiring in a church and house.
Cloud County, Kans.	30	Night					8,000		do	Large modern farm home 5 miles north of Jamestown burned to ground after being struck by lightning.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
West Point, Miss.	30-31	Late night		1			$22,000	$5,000	Electrical	Church steeple struck; buildings struck and damaged. Some cattle killed.
Eastern and western slopes of Divide, Mont.	30-31							See remarks	Frosts and freezes	Extensive damage to early garden crops, fruit trees, and alfalfa.
Borger, Hutchinson, County, Tex.	31	4 p.m.			0	1	See remarks		Tornadoes and wind	First tornado took porch off two homes. Second funnel dipped in a field, then rose and vanished. Winds demolished a 3-car garage and damaged an adjoining garage.
Jefferson County, Kans.	31	11:45 p.m.	440	3½	0	0	4,000		Tornado	Tornado first struck 5 miles southwest of Nortonville where it demolished a 30x40 foot barn on one farm and blew over a shed and broke windows in house nearby. Moving northeastward, it next dipped on a farm 1 mile southwest of Nortonville where it demolished a large chicken house, killed one calf, and injured 2 others.
Table Rock, Pawnee County, Nebr.	31						See remarks		Electrical	Barn struck by lightning and burned.
Pratt, eastern Stafford, and western Reno Counties, Kans.	31-1	11:15 p.m. -1 a.m.					4,000		Wind and rain	At Pratt, a 20x100-foot cattle shed destroyed; at St. John, in eastern Stafford County, falling limbs broke power lines; and at Sylvia, in western Reno County, machines, sheds, storage bins, and stock barns demolished on 2 or 3 farms and roofs torn from 2 barns. At Pratt, peak wind registered 65 m.p.h. about midnight.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

LATE STORM REPORTS FOR APRIL 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Killed	Injured	Property (exclusive of crops)	Crops	Character of storm	Remarks
Morton County, Kans.	April 26	Afternoon					50,000		Hail	Damage to roofs in business district of Elkhart and to cars by two heavy falls of hail; greatest in area since May 1945.
Kenvil, Morris County, N. J.	29	7:15 p.m.	400	½	0	3	50,000		Tornado	Storm came at end of hot day. Funnel cloud seen by several persons. A definite roaring noise heard. Severe thunderstorm accompanied by hail preceded destructive wind. No precipitation at time wind struck, but heavy rain immediately following. Four houses and service station unroofed. Other homes had considerable damage to roofs, porches, and shingles. Several garages collapsed or blown from foundations. Most of damage on Route 6 between Hercules Club house and Kenvil Avenue corner, a distance of about ½ mile. Course of storm cloud was a little south of east. One person violently sucked out of office into main part of garage when garage was unroofed. Damage said to have been done in less than a minute.
Chatauqua County, Kans.	30	11:45 p.m.			0	0	2,000		Tornado	Tornado moving from southwest struck several farms just west of Cedar Vale. Destruction included wrecking of large screened-in porch, tearing roof off stone barn, destroying hollow-tile chicken house, as well as minor damage to sheds, barns, and trees.

CORRECTIONS FOR APRIL 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Killed	Injured	Property (exclusive of crops)	Crops	Character of storm	Remarks
Pratt County, Kans.	April 30	5:30 a.m.	880	12	0	0	50,000		Tornado	Three separate funnel clouds approached city of Pratt from south and damaged areas in southwestern section of town and in business district. Roofs torn off, plate glass windows blown out, and trees, lights and telephone poles and wires blown down. Tornado evidently dipped again northwest of Preston, where a large barn demolished.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

MAY 1951

A disastrous flash flood occurred in the Missouri Basin on Big Creek at Hays, Kans. Six deaths resulted with property damage estimated at near 2 million dollars. Moderate to heavy flooding occurred on the Saline and Solomon Rivers in Kansas. Record stages were reported on the Arkansas River at most stations in the reach between Syracuse and Hutchinson, Kans.

ST. LAWRENCE DRAINAGE.--Some flooding occurred in the Lake Erie drainage in the St. Joseph, St. Marys and Maumee Rivers between the 11th and 14th due to heavy rain. Very little damage resulted as very little spring seeding had been done; some loss, however, resulted from the delay in spring plowing and planting.

UPPER MISSISSIPPI BASIN.--A sharp rise occurred on the Rock River at Moline, Ill., from the heavy rainfall (2-3 inches) on the 9th and 10th. Losses from this rise were of little consequence as the river was already in flood from the heavy rains in April. It receded to within its banks on the 20th.

The flood crest that was moving down the upper Cedar River at the close of April caused a peak reading of 13.5 feet, 0.5 foot above bank-full stage at Cedar Rapids, Iowa, just before midnight on the 2d. The crest flattened rapidly as it moved on downstream and there was little if any overflow in the lower portion of the Cedar. Flood stages occurred along the Raccoon and Des Moines Rivers during the first week in May and persisted until almost midmonth at Tracy, Eddyville and Ottumwa, Iowa, along the lower Des Moines. During the latter part of the month heavy rains caused another brief and relatively minor overflow at those stations. The crests during the May overflows were lower than those recorded earlier in the year and did not materially add to the damages already inflicted. However, they hampered cleanup and repair work and prevented farm operations in bottom land fields. The outstanding feature was the persistence of the wet weather and the prolonged period of high water, especially along the lower Des Moines. By the end of May, streams had been above bank-full at Scott Street below the mouth of the Raccoon in Des Moines for 17 days, at Tracy for 40 days, at Eddyville for 46 days, and at Ottumwa, Iowa, for 43 days.

Heavy rains (1.6 inches) over the upper Illinois Basin during the 24-hour period ending on the morning of the 11th caused light flooding along the entire course of the river between the 11th and 24th. No damage resulted from the overflows.

The flood which was in progress in late April along the Mississippi River from Dubuque, Iowa, to Cape Girardeau, Mo., was subsiding in the beginning of May; the fall continued at Cape Girardeau until May 4th, when another rise, caused by rains far upstream, began. Considerable rain fell in Nebraska, Iowa, northern Missouri and northern Illinois from April 23d to April 30th; on May 1st heavy rain was reported along the Missouri River from Sioux City, Iowa, to St. Joseph, Mo. The crests in the reach between Keokuk, Iowa, and Louisiana, Mo., were higher during this rise than during the previous month when record to near record stages resulted over a large portion of the Mississippi River at and below St. Paul, Minn.

MISSOURI BASIN.--General rains over the western and central sections of the Elkhorn Valley of Nebraska from the 14th through the 19th resulted in flooding in the Atkinson-O'Neill-Neligh sector and in the area near West Point. The rainfall was reported unofficially to have totaled 3 to 5 inches along the tributaries of the Elkhorn in the O'Neill-Atkinson area from the 14th to the 17th with a general average of 1 to 2 inches over the western half of the Elkhorn Valley in the same period. Flooding in the Atkinson-O'Neill area was reported from the 15th to the 17th; in the Ewing, Nebr., area from the 17th to the 18th and in the lowlands around Neligh, Nebr., from the 18th to the 19th. The highest stage at Neligh was 10.49 feet on the 19th. Drainage into the main stream of the Elkhorn produced overflow in the lowlands at West Point, Nebr., from the 21st to the 23d, the highest stage at West Point being 9.85 feet on the 22d.

A disastrous flash flood occurred on Big Creek, a tributary of the Smoky Hill River on the 22d. The flood waters caused 6 deaths and very heavy property losses in parts of Hays, Kans., where flood depths were reported as great as 15 to 20 feet. The disaster was the worst in the history of Hays with 75 blocks of the City and the campus of Fort Hays State College inundated. This flooding followed very intense rains which fell over a limited area centered about 4 miles west and upstream from Hays, near Yocemento. A later bucket survey reveals that the 12-inch 48-hour isohyet encompassed about 3 square miles and the 8-inch isohyet about 25 square miles. The bulk of the rain appears to have fallen in a 3 or 4-hour period beginning around 8 p.m. on the 21st, although rain continued until about 7 a.m. on the 22d and from 1 to 2 inches fell in the same area the night of the 20-21st. Big Creek went over its banks at Hays at about 12:30 a.m. on the 22d, rose very rapidly and apparently crested at about 2:30 a.m. Heavy damages resulted from the flash flood with preliminary estimates placed at near 2 million dollars.

Moderate to heavy flooding occurred on the Saline and the Solomon Rivers. Light to moderate overflows took place locally on the Kansas, Big Blue, Delaware, Marais de Cygnes and Republican Rivers. The most extensive flooding occurred on the upper Solomon Basin from Alton and Kirwin, Kans., on the lower tributaries to below Beloit, Kans., in the main stem and on the lower Saline above Tescott, Kans. At the first of the month, flooding which took place on the Big Blue, the Kansas, the Delaware and the Marais des Cygnes Rivers was caused by heavy thunderstorms which were centered in northeast and east-central Kansas. The second period of flooding had overflows on central and north-central Kansas streams. Heavy precipitation on the 21st and 22d was interspersed with a few 4-5 inch falls. The heaviest amounts were about 12 inches near Hays and near 5 inches at Wakeeney, on the upper Smoky Hill watershed, and near 5-inch amounts in the vicinity of Arapahoe and Alma, Nebr., on the upper Republican. Damages were comparatively light in the majority of cases.

Slight flooding occurred along a 10-mile stretch of the lower portion of the Floyd, from below Merrill, Iowa, to the vicinity of James, Iowa, from the 2d to the 5th and again from the 19th through the 22d. Both overflows resulted from showers and thunderstorms over the Floyd Valley. There was no direct damage during either period of overflow.

Heavy rains (2.33 inches) on the 1st caused the Tarkio, Nodaway, One Hundred and Two, and Grand Rivers and Stranger Creek to rise rapidly to above flood stage. The Missouri River also rose rapidly on the 1st and left its banks from Nebraska City, Nebr., downstream through St. Joseph, Mo. By the

3d the flow of water in the Missouri had increased sufficiently to cause overflows as far downstream as Boonville, Mo. By the 6th the Missouri had risen to 0.5 foot above bank-full level at Jefferson City. Heavy showers on the 9th and 10th caused some flooding along the Grand and Chariton Rivers.

A flash flood developed on the One Hundred and Two River on the evening of May 25th. A series of thunderstorms moved eastward from southeastern Nebraska and produced an average of over 2 inches of rain over the portion of the Nodaway and One Hundred and Two Rivers in southwestern Iowa. An unofficial total of 4 inches was reported from Shambough, Iowa, which is about 6 miles south of Clarinda, Iowa, on the Nodaway River. The Nodaway River remained within banks but the One Hundred and Two River left its banks briefly in the Maryville, Mo., area on the 26th.

OHIO BASIN.—Moderate to heavy rains of the 10th and 11th caused rises to 2 or 3 feet above flood stage at Edwardsport, Ind., on the White River and to approximately 2 to 4 feet above flood stage along the upper Wabash from Wabash to Montezuma, Ind., or a little below. The rains of the 10-11th averaged about 1.25 inches over the lower West Fork of the White River and about 1.5 to 2 inches over the upper portion of the Wabash.

WHITE BASIN.—The only flooding in the White Basin during May was on the lower White River at Clarendon and St. Charles, Ark. This flooding was due to secondary crests on continued high water from the previous months. Damage from this flooding was negligible.

ARKANSAS BASIN.—Heavy rains (5 inches) during the week ending May 22d caused severe flooding along the Little Arkansas River from the 16th through the 20th. The runoff was near a maximum as this heavy rainfall was preceded by a 1.5 inch rain during the previous week.

Locally severe flooding occurred along the Chikaskia and Cimarron in Oklahoma. The crest of 26.6 feet at Blackwell on the Chikaskia was within 1.4 feet of the all time high established in June 1923. Unofficial reports from the headwater areas of the Cimarron indicate that all time record stages were exceeded. Moderate to heavy damages resulted from this flooding.

Record stages occurred on the Arkansas River at Syracuse, Garden City, Great Bend and Hutchinson, Kans. The rainfall along the upper Arkansas during the week ending on the 22d ranged from 3 to 5 inches.

Considerable flooding occurred along the upper reaches of the North and South Canadian Rivers due to the exceptionally heavy rains between the 13th and 19th. During this period record breaking amounts of 4 to 14 inches occurred over much of the Oklahoma and the Texas Panhandle and western Oklahoma. The floods on the North Canadian from Woodward upstream through Woodward, Harper and Beaver Counties were extensive. At Woodward the river remained about 3 feet above flood stage from the 17th to the 19th. At Laverne, Okla., the rainfall observer reported the river was the highest of record or nearly so. Near Beaver, Okla., the river was also near record stages. Thousands of acres of land were flooded and many highways and bridges damaged along the North Canadian and its Wolf Creek tributary in Beaver, Harper and Woodward Counties in Oklahoma, and in the Texas Panhandle. Along the South Canadian River the flooding was confined mostly to bottomlands from Union City downstream through the Norman and Purcell areas.

LOWER MISSISSIPPI BASIN.—The lower Yazoo River continued receding during the month to below bank-full stage at Yazoo City, Miss., on the 17th. It had been above bank-full stage at this point since Jan. 22d for a total of 116 days. Approximately 95 percent of the land north of Yazoo City, Miss., reported flooded previously was free of water by the end of the month. About 75 percent of the land had been returned to cultivation by that time.

ATCHAFALAYA BASIN.—The Atchafalaya continued receding during the month to below flood stage at Atchafalaya, La., on the 25th. It was above flood at this point from Jan. 22 to Feb. 5 and from Feb. 13 to May 25.

WEST GULF OF MEXICO DRAINAGE.—Minor flooding occurred along Running Water Creek, a tributary of the Brazos River in the Plainview, Tex., area, from the heavy rain that occurred from the 15th to the 17th. Unofficial amounts of rain as high as 10 inches were reported during the 3-day period. Damages from the flooding were minor in comparison to the benefits that crops derived from the rain.

COLUMBIA BASIN.—The Kootenai River began rising at a rapid rate early in May and reached a crest of 31.8 feet, 0.8 foot above flood stage, on the 14th. Cool weather that followed caused the river to recede to below flood stage on the 15th. A second crest of 30.9 feet occurred on the 26th. Minor damage occurred about the time of the first crest when weakening dikes gave way. The damage in the Kootenai Valley in the vicinity of Bonners Ferry, Idaho, was slight as compared with that suffered during the flood years of 1948 and 1950. Weakened dikes permitted the overflow of about 200 acres of fertile farm lands and the flooding of a small residential district directly across the river from the city of Bonners Ferry.

The Snake and tributaries rose gradually from the beginning of the month to the end of the month reaching the following stages: Snake River near Heise, Idaho, 9.02 feet on the 30th; Henrys Fork near Rexburg, Idaho, 8.3 feet on the 10th; Snake at Weiser, Idaho, 9.83 feet on the 18th; Snake at Lewiston, Idaho, 14.1 feet on the 26th and 29th; Salmon River at White Bird, Idaho, 2.76 feet on the 29th; and Clearwater at Kamiah, Idaho, 12.7 feet on the 24th. Although no flood stages were reached, the flow at Heise was what in previous seasons had resulted in flooding in the lowlands near Menan farther downstream.

Mild weather in May with short periods of high temperatures was the impetus that produced the seasonal high stages and discharges in the Columbia Basin. The highest temperatures of the month were experienced at most stations in the upper Columbia Basin on the 21st and 22d. There was a marked drop of temperatures on the 23d and again on the 29th with one or two moderately warm days intervening.

Stream flow was well above normal in the main stem of the Columbia and in tributary streams east of the summit of the Cascades during April, and particularly so in May. Short periods of rises and recessions were frequent during May with stages and discharges advancing a little higher on each occasion. The succession of events resulted in crest stages in all streams east of the Cascades during the period from the 26th to the 30th. The Columbia at Vancouver, Wash., rose to flood stage on the 12th and the Willamette at Portland, Oreg., to flood stage on the 14th. Both rivers continued above flood stage until well past the end of May.

FLOOD STAGE DATA

(All dates in May unless otherwise specified)

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			*Ft.*	
ST. LAWRENCE DRAINAGE Lake Erie					
St. Marys: Decatur, Ind.	13	11	14	16.6	13
St. Joseph: Montpelier, Ohio	10	12	14	11.7	13
Maumee: Fort Wayne, Ind.	15	12	12	15.2	12
EAST GULF OF MEXICO DRAINAGE					
Pearl:					
Jackson, Miss.	18	Apr. 22	3	22.4	Apr. 26
Bogalusa, La.	15	Mar. 18	[illegible]	19.6	Apr. 6
				19.5	Apr. 17
Pearl River, La.	12	Mar. 19	4	16.2	Apr. 3
				16.6	Apr. 25
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Rock: Moline, Ill.	10	Apr. 30	20	11.8	13–14
Cedar: Cedar Rapids, Iowa	13	[illegible]	3	13.5	2
Iowa: Wapello, Iowa	10	5	7	11.9	5
		10	11	10.0	11
Skunk: Augusta, Iowa	15	11	13	18.0	11
Raccoon: Van Meter, Iowa	13	1	7	16.6	2
Des Moines:					
Boone, Iowa	12.5	2	5	14.0	3–4
Des Moines, Iowa (Scott St.)	13	2	7	15.6	5
Tracy, Iowa	14	1	12	19.0	5
Eddyville, Iowa	15	Apr. 25	14	17.1	Apr. 28
				20.7	6
		26	28	18.1	27
Ottumwa, Iowa	9	Apr. 26	13	10.1	Apr. 28
				14.1	7
		26	28	11.7	27
Fox: Wayland, Mo.	15	11	12	15.4	12
Illinois:					
Morris, Ill.	13	11	12	15.4	11
La Salle, Ill.	20	11	14	23.0	12
Havana, Ill.	14	Apr. 3	6	16.7	Apr. 19
		13	24	15.2	17
Beardstown, Ill.	14	Feb. 18	10	21.6	Feb. 28
				14.8	Apr. 3
				18.6	Apr. 21
		13	24	15.1	18–19
Mississippi:					
Aitkin, Minn.	12	Apr. 15	17	12.5	Apr. 24
				13.2	8
Dubuque, Iowa	18	Apr. 16	5	22.7	Apr. 22
Gordons Ferry, Iowa	13	Apr. 12	13	20.6	Apr. 23
Clinton, Iowa	16	Apr. 16	10	20.7	Apr. 26
Le Claire, Iowa	12	Apr. 20	6	13.5	Apr. 26
Davenport, Iowa	15	Apr. 18	9	18.3	Apr. 28–29
Muscatine, Iowa	15	Apr. 14	15	21.0	Apr. 29
Keithsburg, Ill.	12	Apr. 12	17	15.8	Apr. 21
				17.1	Apr. 29
				16.9	[illegible]
				16.7	6
Burlington, Iowa	15	Apr. 14	16	16.8	Apr. 21–22
				18.1	Apr. 29
				17.9	1–4
				17.2	11, 12
Keokuk, Iowa	12	Mar. 31	19	14.7	Apr. 5
				17.9	Apr. 17
				17.9	Apr. 22
				19.7	Apr. 30
				20.0	6
				20.3	12
Gregory Landing, Mo.	12	Mar. 31	20	15.1	Apr. 5–6
				18.1	Apr. 16
				20.0	Apr. 29–30
				20.3	7
				20.7	12
		29	29	12.1	29
Quincy, Ill.	14	Mar. 30	20	17.1	Apr. 6
				20.2	Apr. 17
				22.2	1
				22.4	8
				22.9	13
Hannibal, Mo.	13	Mar. 30	26	17.3	Apr. 7
				20.1	Apr. 18
				21.9	1
				22.2	8, 9
				22.6	13
		28	31	14.3	29

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			*Ft.*	
MISSISSIPPI SYSTEM (Cont'd.) Upper Mississippi Basin (Cont'd.)					
Mississippi: (Cont'd.)					
Louisiana, Mo.	14	Mar. 31	20	15.9	Apr. 7
				16.0	Apr. 9
				18.5	Apr. 18
				19.9	2
				20.2	9–10
				20.5	13
Grafton, Ill.	18	Apr. 9	21	21.7	Apr. 20
				22.9	8
St. Louis, Mo.	30	5	8	31.0	[illegible]
Chester, Ill.	27	4	18	30.6	8
Cape Girardeau, Mo.	32	5	13	33.4	9
Missouri Basin					
Floyd: James, Iowa	16	2	5	17.3	3
		19	22	17.0	20
				16.4	21
Elkhorn: Neligh, Nebr.	10	18	19	10.5	19
Tarkio: Fairfax, Mo.	17	1	1	17.4	1
Nodaway: Clarinda, Iowa	14	1	2	19.5	1
One Hundred Two: Maryville, Mo.	14	1	1	15.7	1
		26	26	14.1	26
Saline:					
Wilson, Kans.	12	22	24	18.1	24
Tescott, Kans.	25	26	28	27.1	27
Solomon:					
Alton, Kans.	12	21	21	13.1	21
		22	23	20.6	22
Kirwin, Kans.	13	22	22	19.0	22
Beloit, Kans.	20	22	26	29.8	24
Minneapolis, Kans.	26	27	28	28.6	27
Niles, Kans.	24	27	30	27.7	29
Smoky Hill:					
Ellsworth, Kans.	20	23	24	24.2	23
Abilene, Kans.	22	30	30	22.5	30
Republican:					
Cambridge, Nebr.	6	15	16	6.4	15
				7.2	15
		21	21	7.4	20–21
Orleans, Nebr.	9	21	22	11.6	21
Guide Rock, Nebr.	10	22	22	10.7	22
Clay Center, Kans.	15	23	23	16.8	23
Big Blue:					
Barnston, Nebr.	18	1	2	23.8	1
Marysville, Kans.	35	1	1	38.0	1
Blue Rapids, Kans.	20	1	2	25.0	2
Randolph, Kans.	22	1	2	25.0	2
Delaware: Valley Falls, Kans.	22	1	2	23.9	2
Stranger Creek: Tonganoxie, Kans.	23	2	3	24.5	3
Kansas:					
Manhatten, Kans.	17	1	3	19.3	1
Topeka, Kans.	21	1	2	23.9	2
Lecompton, Kans.	17	2	3	21.0	2
Lawrence, Kans.	18	2	[illegible]	20.6	2
Grand:					
Pattonsburg, Mo.	20	1	3	29.3	2
		10	11	25.0	11
Gallatin, Mo.	20	2	3	23.3	3
Chillicothe, Mo.	18	1	5	28.2	3
		10	13	25.1	12
Sumner, Mo.	25	1	6	30.7	[illegible]
		11	14	29.6	12
Brunswick, Mo.	12	2	7	18.8	5
		12	13	12.6	12
Chariton: Novinger, Mo.	20	11	12	21.5	11
Marais des Cygnes:					
Quenemo, Kans.	30	2	2	32.1	2
Osawatomie, Kans.	28	11	11	28.1	11
La Cygne, Kans.	25	3	[illegible]	26.9	[illegible]
Missouri:					
Nebraska City, Nebr.	15	1	2	17.4	1

FLOOD STAGE DATA

(All dates in May unless otherwise specified)

Table 5–Continued

River and station	Flood stage	Above flood stages –dates		Crest*	
		From–	To–	Stage	Date
MISSISSIPPI SYSTEM (Cont'd.)	*Ft.*			*Ft.*	
Missouri Basin (Cont'd.)					
Missouri: (Cont'd.)					
St. Joseph, Mo.	17	1	3	19.8	3
Kansas City, Mo.	22	[illegible]	4	23.4	3
Lexington, Mo.	22	2	5	26.2	3
Waverly, Mo.	18	1	6	23.9	4
Boonville, Mo.	21	3	6	23.2	5
Jefferson City, Mo.	23	5	6	23.4	6
Herman, Mo.	21	3	7	23.0	6
St. Charles, Mo.	25	4	[illegible]	27.4	7
Ohio Basin					
West Fork: Edwardsport, Ind.	12	12	16	14.6	14
Wabash:					
Wabash, Ind.	12	11	13	15.1	12
La Fayette, Ind.	11	12	14	14.8	13
Covington, Ind.	16	13	15	17.6	14
Montezuma, Ind.	—	--	--	15.8	15
White Basin					
White:					
Clarendon, Ark.	26	Apr. 28	10	26.5	2
St. Charles, Ark.	25	3	11	25.1	4
Arkansas Basin					
Little Arkansas:					
Sedgwick, Kans.	18	16	20	24.4	17
Ripley, Kans.	12	17	19	16.8	18
Ninnescah: Belle Plain, Kans.	18	17	19	26.0	18
Cimarron: Perkins, Okla.	11	18 23	21 23	13.0 13.9 11.6	18 20 23
Cottonwood:					
Cottonwood Falls, Kans.	9	1	3	13.6	1
Emporia, Kans.	20	1 20	[illegible] 21	25.1 21.3	2 20
Neosho:					
Emporia, Kans.	22	1	2	27.0	1
Neosho Rapids, Kans.	22	1	[illegible]	26.2	2
Burlington, Kans.	27	3	6	32.4	3
Le Roy, Kans.	23	3	6	25.7	4
Iola, Kans.	15	4	7	18.3	6
Chanute, Kans.	20	6	7	22.4	7
Oswego, Kans.	17	8 23	9 24	17.5 18.4	8 23
North Canadian: Woodward, Okla.	5	16	19	8.4	17
Canadian:					
Canadian, Tex.	[illegible]	17	17	8.7	17
Union, Okla.	7	17	18	8.5	17
Arkansas:					
Syracuse, Kans.	7	15	17	12.7	15
Garden City, Kans.	7	16	17	9.6	16
Dodge City, Kans.	10	18	18	12.8	18
Great Bend, Kans.	[illegible]	18	27	10.3 10.6 11.3	20 22 24
Hutchinson, Kans.	6	19	28	9.2	27
Wichita, Kans.	9	17	24	12.0	18
Ralston, Okla.	16	19 23	21 25	19.8 18.5	20 24
Webbers Falls, Okla.	23	21	22	23.4	22
Van Buren, Ark.	22	22	23	22.2	23
Lower Mississippi Basin					
Yazoo: Yazoo City, Miss.	29	Jan. 22	17	33.3 36.6	Feb. 28 Mar. 28
Mississippi: Caruthersville, Mo.	32	Apr. 2	1	35.6 34.8	Apr. 6 Apr. 26
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La.	25	Feb. 13	25	28.0 27.6	Mar. 20 Apr. 16–17

River and station	Flood stage	Above flood stages –dates		Crest*	
		From–	To–	Stage	Date
PACIFIC SLOPE DRAINAGE	*Ft.*			*Ft.*	
Kootenai: Bonners Ferry, Idaho	31	13	15	31.8	14
Flathead: Columbia Falls, Mont.	14	11	13	15.2	13
Willamette: Portland, Oreg.	18	14	June 5	21.1	27
Columbia: Vancouver, Wash.	15	12	June 13	21.5	27

* Provisional.

RADIOSONDE DATA

Average monthly values

Table 20

MAY 1951

Standard pressure surface (mb)	ALBANY, N. Y. (1002 MB.)				ALBUQUERQUE, N. MEX. (835 MB.)				ATLANTA, GA. (980 MB.)				BIG SPRING, TEX. (923 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	86	12.9	70	31	1,620	20.2	25	31	307	19.9	56	31	784	22.5	44
1,000	30	101			31	24			31	128			31	71		
950	29	535	12.7	57	31	485			31	577	20.9	48	31	526		
900	30	985	10.5	57	31	963			31	1,038	17.7	50	31	1,000	22.4	42
850	30	1,459	7.5	57	31	1,460			31	1,524	14.0	55	31	1,494	19.3	43
800	30	1,956	4.6	54	31	1,983	18.7	21	31	2,032	10.5	55	31	2,012	16.2	43
750	30	2,482	1.4	56	31	2,538	14.2	23	30	2,575	7.2	52	31	2,563	12.8	40
700	30	3,031	-1.8	58	31	3,108	8.9	28	31	3,131	4.0	47	31	3,132	8.7	39
650	30	3,620	-5.0	55	31	3,718	3.4	33	31	3,737	0.7	40	31	3,745	4.4	38
600	30	4,243	-8.3	50	31	4,359	-2.2	40	31	4,369	-2.9		30	4,387	-0.4	38
550	29	4,905	-12.6	46	31	5,043	-8.2	48	30	5,065	-7.1		30	5,080	-5.7	37
500	29	5,627	-17.2	44	31	5,775	-14.1	52	30	5,794	-11.9		29	5,817	-11.2	
450	29	6,409	-22.7	42	30	6,568	-20.4	51	27	6,606	-17.2		28	6,623	-16.6	
400	29	7,261	-29.3	40	30	7,425	-26.9	42	26	7,469	-23.3		28	7,493	-23.1	
350	29	8,200	-36.7		30	8,373	-34.5		22	8,436	-30.6		28	8,457	-30.3	
300	29	9,249	-44.4		29	9,433	-42.4		20	9,517	-39.0		28	9,534	-38.7	
250	29	10,449	-51.9		29	10,640	-51.0		14	10,729	-48.3		28	10,760	-48.4	
200	28	11,879	-56.1		29	12,066	-58.1		11	12,155	-56.5		27	12,201	-57.0	
175	28	12,726	-57.0		28	12,910	-59.1		11	12,997	-58.9		26	13,043	-59.8	
150	26	13,705	-57.5		26	13,868	-60.1		10	13,947	-59.5		25	14,005	-62.4	
125	26	14,855	-57.8		24	14,999	-62.5		10	15,078	-62.9		24	15,121	-65.6	
100	25	16,261	-58.5		23	16,369	-65.6		9	16,438	-64.6		21	16,461	-68.2	
80	22	17,669	-58.5		19	17,713	-62.8		8	17,802	-63.7		17	17,801	-67.4	
60	15	19,473	-56.7		15	19,486	-61.5		6	19,574	-61.3		12	19,571	-62.2	
50	14	20,636	-55.8		11	20,627	-58.8						8	20,662	-60.7	
40	5	22,064	-53.9		5	22,087	-55.9									

Standard pressure surface (mb)	BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (912 MB.)				BROWNSVILLE, TEX. (1011 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	505	15.0	56	31	868	15.7	51	31	6	24.3	83
1,000	30	106			31	80			31	103	23.7	83
950	30	549			31	527			31	559	21.6	77
900	30	1,003	14.0	39	31	983	16.5	42	31	1,021	20.7	64
850	30	1,481	10.1	44	31	1,467	13.2	39	31	1,514	19.0	55
800	30	1,981	6.0	51	31	1,973	9.4	43	31	2,033	16.3	52
750	30	2,515	2.4	48	31	2,508	5.2	47	31	2,587	13.6	43
700	30	3,061	-0.8	48	31	3,064	1.0	50	31	3,157	10.3	37
650	30	3,657	-4.6	45	31	3,661	-3.1	48	31	3,775	6.2	37
600	30	4,274	-8.4	39	31	4,285	-7.0	40	31	4,419	1.4	41
550	30	4,951	-12.7	36	30	4,965	-11.0	35	31	5,114	-3.7	40
500	30	5,663	-17.7	33	30	5,688	-15.8	35	31	5,858	-8.9	37
450	30	6,452	-23.4		30	6,475	-21.6	36	31	6,672	-14.2	
400	30	7,294	-29.3	31	30	7,331	-28.0	35	31	7,552	-20.2	
350	30	8,234	-36.2		30	8,275	-35.6		31	8,527	-27.3	39
300	30	9,286	-43.8		29	9,328	-43.4		31	9,618	-35.4	
250	29	10,486	-51.3		29	10,532	-51.6		31	10,863	-44.8	
200	29	11,914	-56.8		25	11,979	-57.3		30	12,321	-55.2	
175	29	12,759	-56.9		24	12,819	-56.8		29	13,161	-60.4	
150	29	13,736	-56.0		24	13,798	-55.8		29	14,111	-64.9	
125	29	14,892	-56.9		23	14,953	-56.0		27	15,217	-68.3	
100	27	16,294	-58.3		23	16,366	-57.4		22	16,541	-70.9	
80	26	17,697	-58.5		18	17,766	-56.5		11	17,867	-68.5	
60	20	19,514	-58.0		12	19,583	-55.6		7	19,563	-64.3	
50	15	20,646	-57.9		8	20,764	-55.5		5	20,693	-58.8	
40	6	22,107	-56.3									

Standard pressure surface (mb)	BUFFALO, N. Y. (988 MB.)				BURRWOOD, LA. (1015 MB.)				CAMAGUEY, CUBA (1002 MB.)				CARIBOU, MAINE (989 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	221	12.1	70	31	3	22.5	86	31	122	22.5	89	31	191	8.5	69
1,000	30	116			31	136	23.0	73	31	136	22.6	88	31	95		
950	30	555	13.9	53	31	590	21.0	60	31	595	21.9	75	31	524	9.5	57
900	30	1,003	11.9	51	31	1,048	18.7	46	31	1,053	19.6	68	31	968	6.9	58
850	30	1,479	9.0	52	31	1,536	15.9	43	31	1,544	16.6	68	31	1,435	3.8	62
800	30	1,979	5.9	51	31	2,049	13.1	39	31	2,058	13.5	64	31	1,925	0.9	58
750	30	2,510	2.9	52	31	2,599	10.3	38	31	2,604	10.8	51	31	2,450	-1.7	53
700	30	3,060	-0.2	48	31	3,160	7.1	36	31	3,173	7.7	45	31	2,988	-4.4	54
650	30	3,655	-3.4	45	31	3,774	3.4	33	31	3,787	4.5	42	31	3,575	-7.6	53
600	29	4,274	-7.3	44	31	4,409	-1.1	34	31	4,429	0.9	40	31	4,187	-10.8	49
550	27	4,953	-11.7	42	30	5,103	-5.5	34	31	5,125	-3.0	35	30	4,859	-14.4	48
500	29	5,670	-16.3	37	30	5,840	-10.3		31	5,873	-7.0	30	30	5,571	-19.1	44
450	29	6,456	-21.7	35	30	6,650	-15.9		31	6,691	-12.1		30	6,353	-24.4	41
400	28	7,317	-28.0		30	7,521	-22.2		30	7,578	-18.5		30	7,195	-30.4	39
350	28	8,261	-35.4		30	8,488	-29.3		30	8,560	-25.5	33	30	8,130	-37.4	
300	28	9,316	-43.1		30	9,569	-37.7		29	9,660	-33.8	37	30	9,178	-44.5	
250	27	10,514	-50.8		30	10,801	-47.2		29	10,916	-42.9		30	10,380	-50.8	
200	27	11,950	-55.6		29	12,241	-57.3		29	12,387	-54.0		30	11,822	-54.0	
175	25	12,791	-56.9		28	13,076	-61.1		26	13,237	-59.9		29	12,673	-54.3	
150	26	13,766	-57.5		28	14,026	-64.1		20	14,191	-66.0		29	13,660	-54.1	
125	21	14,922	-57.4		28	15,133	-66.9		10	15,273	-70.6		29	14,827	-54.5	
100	19	16,327	-57.7		28	16,474	-68.3		9	16,589	-71.9		27	16,255	-54.9	
80	17	17,734	-57.6		26	17,809	-67.9		7	17,912	-72.7		22	17,677	-55.5	
60	11	19,561	-56.5		20	19,555	-63.7		5	19,605	-71.0		14	19,506	-54.8	
50	10	20,717	-54.9		10	20,669	-60.7									
40	5	22,157	-53.9													

Standard pressure surface (mb)	CHARLESTON, S. C. (1013 MB.)				CIUDAD VICTORIA, MEX. (970 MB.)				COLUMBIA, MO. (986 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	13	18.4	78	30	335	30.5	49	31	239	17.9	62
1,000	31	128	21.1	64	30	64			31	114		
950	31	577	20.3	50	30	528	28.9	51	31	562	18.8	50
900	31	1,037	16.9	54	30	1,003	24.7	57	31	1,018	15.4	54
850	31	1,522	13.2	58	30	1,501	20.5	63	31	1,500	11.8	58
800	31	2,029	9.6	57	29	2,023	16.6	67	31	2,004	8.7	55
750	31	2,569	6.5	50	29	2,581	13.2	63	31	2,543	5.8	49
700	31	3,126	3.5	43	29	3,149	9.8	54	31	3,098	2.9	43
650	31	3,727	-0.1	40	28	3,770	5.9	50	31	3,700	-0.6	44
600	31	4,360	-3.6	34	29	4,413	1.6	47	31	4,330	-4.3	38
550	31	5,044	-7.4	31	28	5,111	-3.3	52	31	5,014	-8.6	36
500	31	5,780	-12.2	27	29	5,858	-7.9	45	31	5,743	-13.5	
450	31	6,581	-18.0		27	6,676	-12.9		31	6,541	-19.2	
400	31	7,446	-24.5		27	7,560	-18.9		31	7,401	-25.5	
350	31	8,404	-31.9		27	8,539	-26.3		31	8,356	-32.8	
300	31	9,475	-40.2		26	9,634	-34.3		31	9,421	-41.1	
250	31	10,695	-48.9		25	10,888	-43.5		30	10,643	-49.6	
200	31	12,131	-57.2		21	12,365	-53.9		30	12,081	-56.0	
175	31	12,972	-58.5		21	13,210	-59.5		28	12,924	-58.4	
150	30	13,934	-59.8		20	14,165	-64.4		28	13,891	-59.1	
125	30	15,067	-61.6		20	15,268	-68.8		27	15,028	-60.0	
100	30	16,441	-63.7		19	16,597	-72.6		27	16,414	-61.3	
80	29	17,806	-63.6		13	17,908	-71.6		22	17,811	-61.4	
60	26	19,579	-61.5		8	19,631	-64.4		20	19,595	-59.7	
50	23	20,710	-59.1		6	20,763	-59.8		13	20,717	-57.7	
40	12	22,110	-54.0		5	22,132	-57.7		5	22,087	-56.6	

Standard pressure surface (mb)	DODGE CITY, KANS. (922 MB.)				EL PASO, TEX. (877 MB.)				ELY, NEV. (807 MB.)				GLASGOW, MONT. (937 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	792	16.4	70	31	1,195	24.6	19	31	1,908	12.1	43	31	648	15.4	47
1,000	30	91			31	29			31	63			31	87		
950	30	536			31	495			31	514			31	531		
900	30	999	17.2	57	31	974			31	980			31	988	14.8	36
850	30	1,486	14.5	58	31	1,473	23.5	20	31	1,464			31	1,468	11.0	39
800	30	1,996	11.7	55	31	1,996	19.2	21	31	1,977	12.6	39	31	1,970	6.9	44
750	30	2,538	8.7	50	31	2,551	14.5	23	31	2,517	9.4	39	31	2,501	2.7	47
700	30	3,100	4.8	51	31	3,122	9.6	26	31	3,083	4.7	44	31	3,051	-1.3	49
650	29	3,703	0.9	51	31	3,735	4.5	30	31	3,683	-0.2	49	31	3,642	-4.9	47
600	29	4,339	-3.5	51	31	4,376	-1.0	36	31	4,317	-5.4	54	30	4,264	-8.8	38
550	29	5,021	-8.1	47	31	5,065	-6.7	39	31	4,997	-10.3	57	30	4,937	-13.1	38
500	29	5,755	-13.4	47	31	5,799	-12.7	37	31	5,723	-15.4	51	30	5,652	-18.3	36
450	29	6,548	-18.9	41	31	6,599	-18.6	33	31	6,514	-21.0	48	30	6,437	-23.5	
400	29	7,415	-25.4	39	31	7,462	-24.8	31	31	7,369	-27.2	39	30	7,282	-29.6	
350	29	8,369	-32.5	40	31	8,419	-32.0		31	8,316	-34.5		30	8,220	-36.8	
300	29	9,437	-40.0		31	9,490	-40.0		31	9,374	-42.9		30	9,270	-44.0	
250	29	10,658	-48.6		30	10,704	-49.0		30	10,585	-51.3		30	10,473	-51.3	
200	27	12,095	-56.1		29	12,141	-57.3		25	12,030	-56.5		30	11,907	-54.5	
175	25	12,941	-57.6		27	12,987	-59.7		23	12,880	-55.5		30	12,761	-54.1	
150	25	13,913	-58.0		27	13,946	-61.8		20	13,875	-55.8		29	13,752	-54.2	
125	24	15,053	-60.0		25	15,073	-64.6		20	15,029	-58.2		27	14,917	-55.3	
100	20	16,437	-62.6		24	16,425	-66.5		18	16,431	-59.6		26	16,341	-56.2	
80	17	17,797	-62.1		21	17,768	-64.6		17	17,820	-59.2		23	17,756	-56.9	
60	14	19,586	-58.8		15	19,523	-61.5		11	19,643	-57.4		20	19,586	-55.7	
50	9	20,742	-57.8		11	20,673	-58.8		10	20,791	-56.1		14	20,753	-54.8	
40					6	22,109	-54.6						5	22,208	-53.8	

Standard pressure surface (mb)	GRAND JUNCTION, COLO. (849 MB.)				GREAT FALLS, MONT. (885 MB.)				GREENSBORO, N. C. (983 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,474	16.5	37	31	1,128	13.1	44	31	273	16.3	71
1,000	31	45			31	81			31	123		
950	31	502			31	526			29	568	18.3	54
900	31	972			31	985			31	1,025	15.5	23
850	31	1,458			31	1,462	11.4	39	31	1,508	12.1	61
800	31	1,976	15.5	31	31	1,965	7.4	43	31	2,012	8.5	65
750	31	2,522	10.9	35	31	2,494	3.2	50	31	2,548	5.0	64
700	31	3,089	6.0	41	31	3,047	-1.0	54	31	3,103	1.8	56
650	31	3,695	0.8	48	31	3,637	-5.0	52	31	3,701	-1.5	47
600	31	4,327	-4.4	55	31	4,259	-8.9	50	31	4,331	-5.1	43
550	31	5,008	-9.7	55	31	4,930	-13.0	46	30	5,019	-8.9	35
500	31	5,735	-15.1	52	31	5,646	-17.9	46	30	5,747	-13.7	
450	31	6,528	-21.1	46	31	6,429	-23.2	46	30	6,546	-19.3	
400	31	7,381	-27.5	41	31	7,277	-29.5	47	30	7,405	-25.8	
350	31	8,326	-35.2	42	30	8,219	-36.7	44	30	8,358	-32.9	
300	31	9,382	-43.2		30	9,268	-44.9		30	9,425	-40.9	
250	30	10,591	-51.3		29	10,463	-53.0		30	10,641	-49.5	
200	26	12,028	-56.8		27	11,890	-57.3		28	12,075	-56.7	
175	25	12,862	-57.5		27	12,736	-56.3		28	12,918	-57.9	
150	23	13,838	-56.9		26	13,722	-55.6		27	13,889	-58.4	
125	22	14,986	-59.0		21	14,881	-55.8		26	15,030	-59.3	
100	22	16,376	-61.4		18	16,299	-57.0		25	16,415	-61.3	
80	19	17,761	-60.5		16	17,704	-57.1		20	17,784	-61.6	
60	15	19,569	-58.3		14	19,522	-57.3		9	19,550	-59.0	
50	14	20,713	-57.5		11	20,690	-56.1		6	20,699	-57.3	
40												

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

MAY 1951

Standard pressure surface (mb.)	HATTERAS, N. C. (1013 MB.)				HAVANA, CUBA (1009 MB.)				HILO, T. H. (1015 MB.)				INTERNAT. FALLS, MINN. (971 MB.)				JOLIET, ILL. (993 MB.)				LAKE CHARLES, LA. (1014 MB.)				LANDER, WYO. (827 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	18.7	82	31	49	23.9	78	30	9	25.1	68	29	361	12.0	67	31	179	14.2	77	31	5	21.5	81	31	1,696	11.6	54
1,000	31	114	18.6	75	31	132	24.1	77	30	143	23.6	71	29	113			31	116			31	129	23.0	73	31	71		
950	31	558	17.0	66	30	589	22.4	69	30	591	19.6	78	28	549	12.9	60	31	556	16.1	59	31	582	21.1	63	31	516		
900	31	1,013	14.4	62	31	1,051	19.9	64	30	1,052	16.1	81	29	1,000	10.9	59	31	1,012	13.5	57	31	1,042	18.7	57	31	984		
850	31	1,494	11.3	59	30	1,542	16.9	64	30	1,537	13.0	82	29	1,474	8.1	59	31	1,490	10.0	61	31	1,531	16.0	50	31	1,463		
800	31	1,998	8.1	58	31	2,057	14.0	55	30	2,045	10.9	72	29	1,972	5.3	52	31	1,991	7.0	55	31	2,044	13.4	47	31	1,972	11.6	44
750	31	2,532	4.9	52	31	2,604	11.2	44	30	2,591	9.8	42	29	2,502	2.5	49	31	2,523	4.0	52	31	2,590	10.7	41	31	2,512	7.5	47
700	31	3,087	1.7	45	31	3,172	8.0	40	30	3,154	8.2	24	29	3,052	- 0.6	49	31	3,077	0.9	49	31	3,156	7.4	40	31	3,071	3.1	52
650	30	3,681	- 1.8	42	31	3,785	4.5	36	30	3,769	5.7		29	3,647	- 3.8	50	31	3,677	- 2.5	49	31	3,766	3.5	39	31	3,671	- 1.5	57
600	30	4,310	- 5.4	37	31	4,428	0.8	36	30	4,413	2.2		29	4,269	- 7.5	52	31	4,301	- 6.1	39	31	4,406	- 0.8	37	31	4,299	- 5.8	56
550	30	5,014	- 9.7	37	30	5,127	- 2.7	30	30	5,114	- 1.6		28	4,943	-12.0	52	31	4,984	- 9.9		31	5,099	- 5.3	31	31	4,981	-10.8	55
500	29	5,715	-14.5		31	5,872	- 7.0	27	30	5,863	- 6.2		29	5,664	-16.6	50	31	5,706	-15.0	35	31	5,836	-10.5		31	5,700	-15.8	49
450	29	6,512	-19.8		31	6,695	-12.2		30	6,686	-11.7		28	6,449	-22.1	46	31	6,502	-20.6		31	6,643	-16.1		31	6,493	-21.5	44
400	29	7,369	-26.3		30	7,577	-18.8		29	7,570	-18.1		29	7,303	-28.5	44	31	7,355	-26.9	31	31	7,514	-22.5		31	7,342	-28.0	42
350	29	8,319	-33.9		29	8,557	-26.0		26	8,551	-25.7		29	8,245	-35.7		30	8,302	-34.5		31	8,479	-29.8		31	8,286	-35.5	38
300	29	9,380	-41.7		30	9,654	-34.1		27	9,650	-34.3		29	9,297	-44.0		31	9,362	-42.5		31	9,558	-38.2		31	9,339	-44.2	
250	29	10,593	-50.1		29	10,906	-43.3		24	10,908	-43.9		28	10,497	-52.5		31	10,573	-50.3		31	10,785	-47.9		30	10,539	-52.8	
200	28	12,035	-56.7		28	12,378	-54.3		24	12,370	-54.8		28	11,920	-57.2		30	12,012	-56.7		31	12,224	-57.2		28	11,963	-57.8	
175	27	12,880	-57.8		24	13,227	-59.9		24	13,213	-60.2		25	12,749	-56.5		29	12,859	-58.4		31	13,059	-61.1		28	12,804	-57.9	
150	25	13,850	-58.1		16	14,174	-65.7		24	14,162	-65.6		25	13,727	-55.6		27	13,824	-59.2		31	14,008	-64.2		27	13,783	-57.1	
125	23	14,991	-59.0		14	15,264	-71.1		24	15,254	-70.8		25	14,888	-55.6		27	14,963	-59.9		31	15,115	-67.0		27	14,933	-57.8	
100	21	16,383	-61.0		14	16,569	-74.5		22	16,559	-73.6		22	16,307	-56.2		26	16,357	-60.2		30	16,450	-69.2		26	16,338	-59.2	
80	19	17,769	-61.4		13	17,874	-71.7		19	17,860	-72.5		20	17,722	-56.2		22	17,748	-60.1		28	17,788	-68.4		23	17,731	-59.1	
60	14	19,568	-59.5		9	19,586	-66.3		18	19,574	-66.6		12	19,540	-56.0		16	19,561	-59.1		22	19,538	-63.7		19	19,531	-57.5	
50	11	20,705	-57.5		6	20,697	-62.7		17	20,692	-62.6						13	20,720	-58.0		21	20,665	-60.1		12	20,669	-56.7	
40					6	22,086	-57.5		16	22,082	-58.4						7	22,093	-56.7		17	22,064	-56.5		9	22,080	-55.5	
30									13	23,891	-54.8										6	23,943	-52.3					
20									5	26,464	-49.9																	

	LAS VEGAS, NEV. (932 MB.)				LITTLE ROCK, ARK. (1005 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. (968 MB.)				MERIDA, MEXICO (1009 MB.)				MIAMI, FLA. (1015 MB.)				NANTUCKET, MASS. (1011 MB.)			
SURFACE	31	660	24.9	17	31	79	20.2	66	21	14	25.2	74	31	401	16.8	50	31	27	27.4	66	31	4	23.7	74	30	14	10.1	89
1,000	31	37			31	121	21.4	60	21	83	24.6	72	31	125			31	107	26.8	67	31	136	24.0	69	30	107	11.8	78
950	31	496			31	570	20.7	51	21	539	23.3	51	30	567	16.1	47	31	566	25.6	59	31	586	21.5	66	30	540	12.4	62
900	31	969	24.2		31	1,031	17.1	56	21	1,005	23.5	35	31	1,021	12.9	50	31	1,035	23.1	57	31	1,051	18.4	64	30	989	10.2	61
850	31	1,464	20.2	20	31	1,516	13.1	61	21	1,501	21.3		31	1,498	9.1	57	31	1,531	19.8	59	31	1,539	15.3	58	30	1,462	7.3	61
800	31	1,982	15.6	23	31	2,024	10.7	48	21	2,024	18.5		31	1,997	5.5	63	31	2,051	16.3	57	31	2,051	12.6	48	30	1,959	4.4	62
750	31	2,527	11.0	27	31	2,569	8.5	39	21	2,581	15.4		31	2,531	2.2	56	31	2,602	12.9	49	31	2,592	9.7	45	30	2,489	1.8	56
700	31	3,095	6.0	32	31	3,126	5.5	38	21	3,154	11.3		31	3,076	- 0.6	47	31	3,174	9.7	38	31	3,159	6.4	40	30	3,035	- 1.1	51
650	31	3,701	1.0	38	31	3,734	1.7	38	21	3,775	7.0		31	3,670	- 3.8	44	31	3,795	5.8	38	31	3,764	2.8	39	29	3,626	- 4.4	46
600	31	4,335	- 4.0	40	31	4,369	- 2.5	37	21	4,420	2.6		31	4,293	- 7.8	42	31	4,436	2.2	36	31	4,406	- 1.0	40	29	4,246	- 7.9	42
550	31	5,018	- 8.6	39	31	5,055	- 7.1	38	21	5,118	- 2.2		31	4,965	-12.3	42	31	5,135	- 1.6	33	31	5,095	- 4.6	31	28	4,921	-12.5	39
500	31	5,748	-13.7	36	31	5,789	-12.3	34	21	5,868	- 7.2		31	5,685	-17.1	39	30	5,887	- 5.8	33	31	5,840	- 9.3		27	5,636	-17.2	36
450	31	6,541	-19.5		29	6,594	-17.8		20	6,690	-12.5		31	6,470	-22.5	39	30	6,712	-11.1	39	31	6,655	-14.5		26	6,431	-22.3	
400	31	7,404	-26.4		28	7,460	-24.0		20	7,571	-18.8		31	7,322	-28.8	39	30	7,599	-17.4	35	31	7,529	-20.4		26	7,280	-28.6	
350	31	8,354	-33.9		28	8,420	-31.2		19	8,551	-26.6		31	8,263	-36.0		30	8,586	-24.1		30	8,508	-27.6		25	8,222	-36.0	
300	31	9,415	-42.4		28	9,493	-39.5		19	9,645	-34.8		31	9,316	-43.9		30	9,691	-32.4		30	9,598	-36.2		26	9,275	-43.9	
250	31	10,625	-50.6		28	10,715	-48.7		17	10,891	-44.3		31	10,517	-52.2		30	10,950	-42.3		29	10,840	-45.3		26	10,476	-51.3	
200	31	12,054	-57.5		27	12,147	-57.2		17	12,350	-55.2		30	11,931	-57.5		29	12,420	-54.3		29	12,297	-55.4		23	11,905	-56.3	
175	30	12,899	-58.3		26	12,979	-59.5		15	13,188	-60.3		30	12,774	-57.3		28	13,263	-61.0		29	13,139	-59.8		22	12,755	-57.3	
150	30	13,870	-57.9		25	13,938	-60.2		13	14,137	-64.6		29	13,754	-56.8		25	14,211	-67.7		26	14,092	-64.4		21	13,728	-57.9	
125	28	15,020	-60.3		24	15,064	-62.7		9	15,232	-69.6		27	14,903	-57.0		14	15,300	-72.8		23	15,191	-68.0		21	14,877	-58.1	
100	27	16,403	-62.5		22	16,428	-65.2		7	16,550	-75.5		25	16,311	-58.4		9	16,613	-76.5		21	16,530	-69.8		19	16,273	-58.6	
80	25	17,772	-62.0		18	17,780	-64.5						23	17,725	-58.0		7	17,881	-75.4		18	17,865	-68.5		17	17,675	-58.7	
60	22	19,563	-59.3		11	19,548	-61.8						13	19,566	-56.2						14	19,587	-64.4		12	19,480	-56.4	
50	17	20,707	-58.0		11	20,682	-59.4						5	20,716	-56.7						10	20,723	-60.6		10	20,647	-55.3	
40	10	22,122	-55.3		5	22,119	-57.1														6	22,154	-54.5					
30	6	23,949	-52.5																									

	NASHVILLE, TENN. (994 MB.)				NORTH PLATTE, NEBR. (915 MB.)				OAKLAND, CALIF. (1014 MB.)				OKLAHOMA CITY, OKLA. (968 MB.)				OMAHA, NEBR. (977 MB.)				PHOENIX, ARIZ. (969 MB.)				PITTSBURGH, PA. (969 MB.)			
SURFACE	31	177	18.8	64	31	849	14.3	69	31	6	14.4	68	31	391	18.7	73	31	308	17.4	64	31	338	27.5	25	31	382	15.4	64
1,000	31	125			31	86			31	127	13.5	71	31	106			31	111			31	57			31	115		
950	31	570	19.7	48	31	529			31	566	13.7	61	30	553	19.4	66	31	551	17.3	55	31	517	28.0	18	31	558	15.4	58
900	31	1,032	16.1	53	31	988	15.3	59	31	1,016	14.2	46	31	1,014	17.4	63	31	1,009	14.4	56	31	991	21.4	19	31	1,010	13.0	58
850	31	1,515	12.2	58	31	1,471	13.1	55	31	1,497	11.9	43	31	1,500	14.6	62	31	1,490	11.0	57	31	1,487	20.0	22	31	1,488	9.7	61
800	31	2,019	8.6	58	31	1,978	9.7	57	31	2,001	9.0	41	31	2,011	12.1	61	31	1,993	7.8	56	31	2,004	15.4	26	31	1,989	6.4	62
750	31	2,554	6.0	44	31	2,514	6.3	57	31	2,537	5.6	38	30	2,558	9.3	53	31	2,528	5.2	49	31	2,554	10.8	29	31	2,521	3.3	59
700	31	3,112	3.0	37	31	3,073	2.7	57	31	3,093	2.4	31	30	3,118	5.6	52	31	3,084	2.0	49	31	3,116	6.1	32	31	3,072	0.1	57
650	31	3,715	- 0.3		31	3,674	- 0.9	57	31	3,695	- 1.0		30	3,725	1.9	45	31	3,686	- 1.3	48	31	3,724	1.8	31	31	3,668	- 3.3	53
600	31	4,345	- 4.1		31	4,304	- 5.1	52	31	4,323	- 4.6		30	4,360	- 2.3	41	31	4,313	- 5.0	46	31	4,358	- 2.7	30	31	4,291	[illegible]	[illegible]
550	31	5,032	- 8.3		31	4,988	- 9.4	44	31	5,003	- 9.2		29	5,046	- 7.1	37	31	4,996	- 9.6	46	31	5,044	- 7.5		31	4,968	[illegible]	37
500	31	5,758	-13.2		31	5,712	-14.6	41	31	5,733	-14.4	30	28	5,782	-11.9		31	5,721	-14.6	41	31	5,776	-13.0		31	5,691	-15.5	[illegible]
450	31	6,556	-18.8		30	6,502	-20.4	37	31	6,526	-20.2	29	28	6,583	-17.4		31	6,516	-19.9	39	31	6,572	-19.0		30	6,488	[illegible]	[illegible]
400	31	7,418	-25.1		30	7,360	-26.6	39	31	7,385	-26.7		28	7,452	-23.8		31	7,375	-25.9	36	31	7,436	-25.7		30	7,341	-27.5	34
350	31	8,373	-32.4		29	8,318	-33.7	42	31	8,334	-33.7		28	8,412	-31.4		31	8,328	-33.5		31	8,388	-33.1		29	8,286	-35.3	
300	30	9,436	-40.5		28	9,375	-41.9		31	9,398	-41.6		27	9,481	-39.9		31	9,392	-41.5		31	9,454	-40.9		29	9,341	-43.1	
250	30	10,654	-49.3		28	10,588	-50.2		31	10,610	-50.4		27	10,699	-49.4		30	10,613	-50.5		31	10,670	-49.5		28	10,540	-50.5	
200	30	12,086	-57.4		28	12,019	-57.5		31	12,037	-57.9		26	12,131	-57.3		28	12,050	-57.6		31	12,103	-57.4		25	11,989	-56.3	
175	29	12,918	-59.3		27	12,861	-59.4		29	12,889	-59.0		24	12,965	-59.9		25	12,886	-59.5		31	12,943	-58.9		25	12,831	-58.5	
150	29	13,881	-60.4		26	13,829	-58.1		29	13,858	-58.2		23	13,920	-60.9		27	13,850	-59.8		31	13,908	-59.9		24	13,799	-58.6	
125	27	15,020	-61.7		22	14,974	-58.6		29	15,001	-59.6		23	15,050	-61.9		26	14,996	-59.9		26	15,058	-62.2		24	14,942	-59.0	
100	20	16,394	-62.8		20	16,370	-60.3		25	16,402	-61.8		21	16,434	-64.5		26	16,385	-61.2		21	16,436	-65.3		23	16,331	-59.8	
80	14	17,771	-62.2		18	17,753	-59.8		22	17,788	-61.1		17	17,814	-64.6		23	17,766	-60.9		20	17,793	-64.4		21	17,736	-59.8	
60	9	19,543	-59.6		14	19,558	-58.2		17	19,581	-58.7		15	19,585	-60.5		15	19,576	-58.9		17	19,558	-61.0		14	19,552	58.1	
50					10	20,713	-57.0		13	20,743	-56.9		10	20,727	58.7		9	20,731	-57.3		14	20,688	58.3		11	20,743	-56.9	
40					7	22,142	-55.6		5	22,151	-56.1		5	22,134	-55.3		5	22,168	-54.9		6	22,085	-54.1		8	22,151	-55.4	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

MAY 1951

Standard pressure surface (mb.)	PORTLAND, MAINE (1010 MB.)				RAPID CITY, S. DAK. (903 MB.)				ST. CLOUD, MINN. (976 MB.)				SAN ANTONIO, TEX. (985 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	20	9.6	80	31	966	12.4	57	31	317	14.3	69	30	240	24.0	68
1,000	31	102	11.2	70	31	92			31	108			30	102		
950	31	533	11.4	62	31	535			29	548	15.2	55	30	557	22.5	69
900	31	981	9.1	62	31	990			31	1,000	12.8	55	30	1,021	19.8	72
850	31	1,453	6.8	61	31	1,473	11.9	47	31	1,478	9.5	60	30	1,513	17.5	65
800	31	1,949	4.0	62	31	1,977	8.1	52	31	1,979	6.0	60	30	2,029	15.2	56
750	31	2,475	1.4	60	31	2,512	4.2	58	31	2,509	3.0	56	29	2,582	12.4	47
700	31	3,024	- 1.6	60	31	3,064	0.6	61	31	3,061	0.0	52	30	3,149	9.1	35
650	31	3,615	- 4.9	55	31	3,662	- 3.2	56	31	3,655	- 3.1	49	30	3,762	5.2	32
600	31	4,236	- 8.4	52	31	4,285	- 7.4	52	30	4,284	- 7.2	49	30	4,406	0.6	33
550	31	4,909	-12.4	47	30	4,965	-11.6	46	30	4,963	-11.4	49	30	5,097	- 4.6	32
500	31	5,628	-17.0	42	30	5,683	-16.3	43	30	5,682	-15.9	49	29	5,842	- 9.7	
450	29	6,406	-22.6	37	30	6,473	-21.8	41	30	6,472	-21.3	50	29	6,650	-15.5	
400	30	7,258	-29.0	38	30	7,324	-27.9	41	30	7,327	-27.4	48	29	7,525	-21.9	
350	30	8,199	-36.0	37	30	8,269	-34.8	36	30	8,274	-34.5	41	27	8,493	-29.2	
300	30	9,251	-44.2		30	9,328	-42.6		30	9,333	-42.6		28	9,575	-37.6	
250	30	10,450	-52.4		30	10,535	-51.2		30	10,542	-50.9		28	10,808	-47.1	
200	28	11,858	-55.9		30	11,962	-57.6		29	11,968	-57.1		27	12,245	-56.4	
175	28	12,706	-56.1		30	12,803	-57.3		29	12,813	-57.2		26	13,085	-60.1	
150	27	13,694	-56.2		29	13,782	-56.5		28	13,784	-57.2		25	14,044	-63.1	
125	22	14,851	-56.8		28	14,941	-57.2		27	14,932	-56.9		22	15,155	-66.3	
100	18	16,266	-57.1		28	16,347	-58 8		25	16,343	-58.3		21	16,498	-68.8	
80	16	17,666	-57.7		24	17,745	-59.0		20	17,756	-57.7		19	17,833	-68.2	
60	11	19,487	-55.7		14	19,567	-57.9		12	19,574	-57.5		15	19,579	-63.4	
50	9	20,655	-54.5		8	20,704	-56.8		6	20,699	-58.0		13	20,707	-60.0	
40													8	22,101	-56.5	
30													5	23,925	-52.0	

Standard pressure surface (mb.)	SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1007 MB.)				S. STE. MARIE, MICH. (988 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	19	25.7	83	31	71	12.7	82	31	221	9.6	71
1,000	30	139	25.2	82	31	128	12.5	81	31	117		
950	30	592	22.5	81	31	570	13.1	70	31	552	12.3	53
900	30	1,059	19.9	79	31	1,016	14.5	49	31	1,000	10.9	52
850	30	1,551	17.3	75	31	1,498	13.3	40	31	1,474	8.0	54
800	30	2,068	15.0	58	31	2,005	10.2	40	31	1,971	5.0	55
750	30	2,613	12.2	66	31	2,545	7.1	36	31	2,505	2.1	53
700	30	3,189	9.0	60	31	3,103	4.0	29	31	3,049	- 1.0	51
650	30	3,804	5.3	57	31	3,707	1.0		30	3,647	- 4.5	49
600	30	4,450	1.7	58	31	4,342	- 2.8		30	4,268	- 8.1	44
550	29	5,151	- 1.9	50	31	5,028	- 7.5		30	4,941	-12.5	44
500	28	5,899	- 6.4	48	31	5,760	-12.4	25	30	5,660	-17.0	44
450	27	6,727	-10.9	36	31	6,559	-18.3	24	30	6,445	-22.4	45
400	27	7,613	-16.7		31	7,424	-24.8		30	7,298	-28.6	40
350	25	8,599	-24.0		31	8,381	-32.4		30	8,241	-35.9	
300	24	9,705	-32.3		31	9,449	-40.9		30	9,293	-44.4	
250	24	10,965	-42.5		31	10,664	-50.2		29	10,503	-52.5	
200	24	12,434	-54.6		31	12,091	-59.2		29	11,923	-58.1	
175	24	13,276	-61.0		31	12,923	-60.0		29	12,762	-58.3	
150	22	14,223	-67.8		31	13,886	-59.1		28	13,732	-58.1	
125	17	15,298	-74.0		30	15,030	-60.9		28	14,881	-57.8	
100	15	16,590	-76.9		30	16,408	-62.9		26	16,284	-58.0	
80	15	17,880	-74.2		30	17,782	-62.6		26	17,688	-58.1	
60	7	19,588	-68.5		24	19,562	-58.9		23	19,517	-57.0	
50	7	20,697	-62.5		19	20,695	-57.1		18	20,692	-56.1	
40	7	22,090	-57.4		8	22,102	-55.8		8	22,120	-54.5	
30												

Standard pressure surface (mb.)	SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1012 MB.)				TACUBAYA, MEXICO (773 MB.)				TAMPA, FLA. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	722	15.1	47	31	10	26.6	82	30	2,306	17.5	57	31	9	23.0	75
1,000	31	102			31	115	26.4	80	30	43			31	140	22.7	72
950	31	544			31	577	23.1	80	30	507			31	591	20.7	63
900	31	1,001	13.7	42	31	1,037	20.0	76	30	987			31	1,052	18.2	59
850	31	1,479	9.9	45	31	1,528	17.3	70	30	1,484			31	1,539	15.3	57
800	31	1,979	5.7	53	31	2,045	15.4	52	30	2,016			31	2,051	12.2	54
750	31	2,506	1.7	56	31	2,596	12.8	43	30	2,570	15.8	55	31	2,593	9.2	47
700	31	3,056	- 1.9	55	31	3,167	10.0	37	30	3,148	11.6	60	31	3,158	6.0	43
650	31	3,646	- 5.6	50	31	3,785	6.7	33	30	3,769	7.0	67	31	3,765	2.5	35
600	31	4,264	- 9.5	43	31	4,432	3.1	33	29	4,419	2.3	74	31	4,404	- 1.1	28
550	31	4,936	-13.6	43	31	5,132	- 0.8	29	28	5,120	- 2.3	73	31	5,095	- 5.4	
500	31	5,649	-18.2	47	31	5,886	- 5.4	31	28	5,869	- 6.9	66	31	5,834	- 9.9	
450	31	6,434	-23.5	46	31	6,710	-10.2	32	27	6,694	-11.5	54	31	6,647	-15.4	
400	31	7,278	-29.7	41	31	7,604	-15.8		26	7,578	-17.6	47	31	7,519	-21.2	
350	31	8,216	-36.9		31	8,596	-22.9		20	8,561	-24.4		31	8,490	-28.2	
300	31	9,265	-44.4		31	9,707	-31.2		19	9,667	-32.5		31	9,577	-36.8	
250	31	10,464	-52.2		30	10,973	-41.1		14	10,924	-42.4		31	10,814	-46.5	
200	29	11,887	-56.1		30	12,450	-53.7		10	12,392	-54.6		31	12,261	-56.1	
175	27	12,736	-55.3		30	13,294	-60.5		6	13,227	-60.8		31	13,101	-59.8	
150	27	13,720	-54.3		30	14,237	-67.8		6	14,170	-67.4		29	14,058	-63.3	
125	27	14,887	-54.6		30	15,314	-74.0						29	15,169	-67.0	
100	24	16,309	-55.9		27	16,601	-77.4						28	16,512	-68.2	
80	20	17,723	-56.2		25	17,886	-75.1						25	17,848	-68.2	
60	8	19,541	-56.7		22	19,587	-66.7						24	19,589	-64.6	
50	7	20,699	-55.9		19	20,693	-62.5						18	20,708	-60.7	
40					15	22,096	-57.0						14	22,118	-55.9	
30					7	23,922	-52.0						7	23,933	-53.3	

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1015 MB.)				TOLEDO, OHIO (991 MB.)				WASHINGTON, D. C. (1003 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	31	10.5	83	31	191	13.7	76	31	88	15.8	74
1,000	31	151	9.9	81	31	114			31	117	17.0	63
950	31	577	8.1	74	29	553	15.2	61	31	557	15.9	59
900	31	1,021	6.1	68	31	1,007	12.9	64	31	1,012	13.4	59
850	31	1,488	3.7	65	31	1,485	9.9	65	31	1,491	10.2	62
800	31	1,978	0.9	61	31	1,986	6.9	63	31	1,992	6.8	66
750	31	2,500	- 2.0	58	31	2,519	3.7	66	31	2,524	3.4	61
700	31	3,039	- 4.8	55	31	3,072	0.6	59	31	3,076	0.1	60
650	31	3,624	- 8.1	48	31	3,669	- 2.9	53	31	3,672	- 2.8	51
600	31	4,237	-11.7	49	31	4,294	- 6.5	50	31	4,296	- 6.5	47
550	31	4,905	-15.7	46	31	4,972	-10.4	46	31	4,972	-10.7	41
500	31	5,611	-20.1	42	31	5,697	-15.1	39	31	5,697	-15.5	35
450	31	6,389	-25.4	40	31	6,492	-20.8	38	31	6,488	-21.0	35
400	31	7,228	-31.4	40	29	7,346	-27.3	37	31	7,344	-27.4	33
350	31	8,160	-38.3		29	8,293	-34.8		31	8,289	-35.0	
300	31	9,203	-45.8		29	9,351	-42.8		31	9,346	-42.5	
250	31	10,394	-53.4		28	10,550	-50.8		30	10,549	-50.1	
200	31	11,812	-57.0		28	11,984	-55.9		30	11,984	-56.1	
175	31	12,659	-55.7		27	12,829	-57.3		30	12,828	-57.6	
150	30	13,644	-54.4		26	13,800	-57.8		28	13,802	-57.7	
125	28	14,812	-54.7		24	14,948	-58.8		26	14,946	-58.7	
100	27	16,233	-55.2		23	16,349	-59.6		24	16,341	-60.1	
80	23	17,651	-55.6		21	17,744	-59.9		22	17,736	-60.2	
60	16	19,490	-55.1		21	19,544	-58.5		10	19,548	-59.0	
50	5	20,658	-56.4		19	20,699	-56.8		6	20,751	-56.1	
40					11	22,080	-55.2					
30												

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria Mazatlan and Merida, where they are taken near 0200, G.C.T. "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

MAY 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	154	3.7	31	209	2.3	31	315	2.8	29	287	0.5	31	290	0.4	30	317	3.0
500	--	---	---	--	---	---	31	301	3.3	--	---	---	--	---	---	--	---	---
1,000	30	165	5.7	--	---	---	30	288	3.7	--	---	---	31	340	.4	30	319	3.6
1,500	29	176	6.0	--	---	---	30	294	4.4	29	303	1.9	30	318	1.0	29	311	4.2
2,000	25	196	5.7	31	223	3.7	30	298	4.7	29	284	1.2	27	308	2.3	29	304	3.3
2,500	25	216	5.6	31	227	3.8	28	301	5.3	28	252	1.9	26	294	3.5	29	281	3.1
3,000	23	234	6.1	31	238	5.1	25	312	6.8	26	254	3.3	24	279	4.7	26	256	2.9
4,000	22	261	8.1	27	253	7.7	17	309	9.4	22	258	6.8	21	274	4.6	18	255	5.5
5,000	21	278	10.1	24	264	9.6	10	325	8.2	19	282	8.2	18	279	5.6	17	281	8.4
6,000	21	277	11.8	22	277	11.1				18	294	10.7	15	278	7.6	14	270	6.1
8,000	15	279	12.4	20	277	13.6				14	273	9.4	13	285	10.5			
10,000	12	282	13.6	16	292	17.4												
12,000				10	283	22.5												
14,000																		

Altitude (meters) m.s.l.	Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	117	7.3	30	242	1.8	31	4	1.2	31	231	1.8	30	283	1.9	31	232	4.0
500	30	133	7.6	30	260	3.1	31	329	1.6	31	254	2.3	30	283	2.9	--	---	---
1,000	28	149	5.4	2[illegible]	[illegible]65	3.1	29	314	3.1	30	286	4.2	30	280	4.1	--	---	---
1,500	24	161	3.9	26	269	3.4	25	304	5.9	30	301	6.0	29	279	4.4	31	233	4.2
2,000	19	149	2.8	26	274	3.9	23	294	7.1	28	311	6.6	23	283	3.6	31	234	3.8
2,500	13	131	3.1	23	289	5.3	20	294	9.1	26	313	7.6	20	297	5.1	31	234	4.0
3,000	11	120	2.5	20	307	5.7	20	305	10.0	26	312	7.6	15	284	7.1	31	235	5.4
4,000	10	52	1.6	17	304	6.5	19	307	10.9	23	293	9.6	11	283	8.3	30	238	9.0
5,000				10	306	7.9	16	301	15.0	21	296	11.2	12	293	8.3	30	249	10.5
6,000				10	309	8.1	13	305	12.2	19	289	11.9	10	309	7.6	27	251	11.9
8,000																26	254	14.7
10,000																19	260	17.3
12,000																14	273	18.9
14,000																11	272	23.4

Altitude (meters) m.s.l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	253	1.3	31	280	3.1	30	309	2.3	31	237	1.6	31	40	1.5
500	--	---	---	--	---	---	30	300	2.6	--	---	---	31	311	1.4
1,000	--	---	---	--	---	---	30	301	2.9	31	240	2.8	28	303	3.4
1,500	--	---	---	31	281	3.3	29	305	3.9	30	237	2.9	28	305	4.9
2,000	31	258	1.7	31	278	3.5	29	305	5.0	25	227	2.7	25	312	7.0
2,500	31	266	1.8	31	260	3.5	27	311	7.3	23	232	2.9	22	312	8.8
3,000	31	270	1.9	31	248	3.5	22	323	8.2	21	239	3.1	17	302	10.9
4,000	25	230	3.6	29	230	6.3	16	329	10.0	17	254	2.3	13	298	13.4
5,000	21	246	6.7	24	238	8.3	13	322	11.7	15	273	2.5	11	307	13.9
6,000	17	260	8.3	18	252	8.6	11	337	13.2	14	292	4.2	11	300	14.5
8,000	13	269	13.8												

Altitude (meters) m.s.l.	Joliet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	275	1.8	31	218	2.3	31	228	1.2	31	316	1.7	31	129	2.0	31	240	1.0	31	285	2.4
500	30	278	2.4	--	-		31	235	2.2	31	318	1.8	31	88	1.0	31	251	2.2	31	289	3.5
1,000	28	257	3.0	31	209	4.1	31	232	2.8	31	289	1.7	31	348	1.4	29	277	2.3	31	278	4.0
1,500	25	255	4.1	31	209	3.2	31	242	3.9	30	264	1.3	31	321	3.0	26	304	3.4	30	280	4.5
2,000	23	249	4.1	31	220	2.8	27	272	5.9	27	230	1.6	29	313	5.5	21	307	6.0	26	274	3.6
2,500	22	259	4.9	31	232	3.5	25	287	7.7	23	195	1.9	28	309	5.9	20	308	7.6	24	271	3.4
3,000	19	267	5.5	31	235	4.7	25	289	8.9	22	217	2.4	27	302	7.0	14	307	9.5	22	273	3.8
4,000	15	299	6.3	29	248	6.3	19	285	11.4	19	273	6.1	23	292	7.2	11	311	11.7	19	279	6.2
5,000	10	317	8.4	29	254	8.0	14	282	12.8	16	273	7.4	19	302	8.9	10	310	12.8	12	285	6.6
6,000	10	311	7.7	28	261	9.3				13	296	11.1	19	296	10.1				10	294	6.6
8,000				19	275	11.9															

Altitude (meters) m.s.l.	New York, N.Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	26	221	0.9	31	271	4.9	30	179	4.5	31	128	0.7	31	260	1.1	28	29	0.9
500	26	257	2.8	31	283	4.3	30	176	4.3	31	170	1.1	31	252	1.8	--	---	----
1,000	25	291	4.5	29	293	3.4	30	185	5.0	30	198	2.1	31	240	3.2	28	31	1.0
1,500	25	309	5.4	28	303	3.0	26	200	5.5	28	216	4.2	31	231	3.6	28	312	.8
2,000	25	307	7.4	27	305	2.9	22	224	7.3	26	236	5.3	31	229	4.5	28	259	.6
2,500	23	313	7.6	27	303	3.8	21	243	8.2	23	257	4.0	31	235	5.2	23	230	1.7
3,000	18	326	8.7	25	320	4.8	21	253	9.6	23	270	5.7	30	233	5.7	18	263	5.8
4,000	10	350	9.3	23	320	7.6	19	270	12.3	20	287	8.6	28	243	6.5	16	289	8.2
5,000				23	313	9.5	17	273	13.7	17	300	12.4	27	250	8.7			
6,000				22	300	11.3	17	270	14.7	12	308	10.8	24	255	10.0			
8,000				17	290	12.0	11	268	15.3				18	264	12.8			
10,000				11	291	9.0							13	258	16.7			

Altitude (meters) m.s.l.	St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	344	0.2	31	248	2.4	31	131	4.0	31	253	4.3	31	295	2.4	30	271	2.4
500	31	96	.3	31	217	3.4	31	136	5.3	29	274	2.8	31	298	3.3	30	260	2.5
1,000	30	243	1.1	29	238	3.3	31	145	6.0	26	282	2.1	31	284	3.2	28	270	1.5
1,500	27	254	2.3	28	241	3.4	27	156	5.4	26	286	2.8	31	291	2.9	26	252	1.0
2,000	25	253	2.8	26	246	5.0	25	176	4.3	25	278	4.2	29	295	4.2	25	217	2.2
2,500	23	291	2.8	26	263	6.4	23	198	3.3	25	263	4.4	25	305	5.8	20	202	3.7
3,000	22	290	3.1	23	277	6.8	23	227	3.2	25	255	5.0	21	311	7.3	20	219	3.8
4,000	17	315	5.5	20	276	8.1	21	298	2.6	21	272	7.4	19	317	10.1	17	252	3.9
5,000	14	325	7.8	17	282	8.7	18	308	5.8	19	265	8.1	14	317	11.3	15	247	6.5
6,000	13	319	9.8	17	288	10.0	17	301	7.9	18	275	10.5	10	319	10.8	11	275	7.3
8,000	11	298	10.0	12	273	7.2				17	279	14.4				10	285	12.5
10,000				11	272	9.8												

Altitude (meters) m.s.l.	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	235	3.1	30	293	0.8
500	--	---	---	30	301	2.7
1,000	30	238	3.8	27	286	4.0
1,500	29	240	3.2	26	282	5.4
2,000	26	232	3.0	25	290	6.2
2,500	19	224	3.1	23	300	8.2
3,000	15	249	3.9	17	318	11.0
4,000	12	241	4.5	15	324	10.4
5,000	10	243	7.0	11	317	10.7
6,000				10	325	12.7

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

MAY 1951

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	162	0.1	31	143	4.9	31	95	1.4	31	120	5.2
500	--	---	----	--	---	----	--	---	----	31	139	7.6
1,000	-	---	- -	31	149	6.7	31	110	.7	31	146	6.6
1,500	-	---	----	31	166	7.5	31	219	.6	31	162	5.2
2,000	31	287	3.4	31	194	6.6	30	279	2.0	31	172	4.9
2,500	31	282	5.0	31	220	6.8	30	284	3.7	30	180	4.5
3,000	31	275	5.5	30	231	6.5	30	289	4.1	30	197	4.1
4,000	31	261	6.9	28	258	6.9	30	278	4.7	30	205	3.0
5,000	31	257	8.7	27	266	10.2	30	276	6.1	29	275	3.7
6,000	30	259	9.7	24	278	10.5	29	265	6.3	29	276	5.8
8,000	26	271	13.8	22	263	11.9	27	261	9.5	31	280	12.6
10,000	24	269	15.8	19	257	16.1	24	253	10.6	29	268	19.1
12,000	20	262	21.4	14	254	22.3	17	253	5.8	26	265	22.5
14,000	18	256	18.6	11	252	26.2	16	291	5.6	17	269	21.8
16,000	13	262	12.9				14	284	4.4	11	271	11.5
18,000							11	294	4.3			
20,000												

Altitude (meters) m.s.l.	Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	192	1.1	31	277	1.6	31	243	1.1	31	160	1.0
500	30	148	1.6	31	298	4.1	30	278	3.1	31	200	2.3
1,000	30	146	1.2	31	308	4.5	30	309	5.0	31	210	2.7
1,500	30	45	.5	31	317	5.0	30	313	5.2	31	218	2.6
2,000	30	322	1.7	31	309	4.9	30	314	5.6	31	253	3.3
2,500	31	315	3.3	31	308	5.3	31	314	6.1	31	275	4.7
3,000	31	303	4.2	31	301	5.8	31	315	6.5	31	279	5.8
4,000	31	289	6.4	31	294	8.1	31	305	7.6	31	281	7.5
5,000	30	294	8.1	30	284	9.4	31	308	9.0	31	282	9.4
6,000	30	296	8.9	30	283	10.6	29	305	11.5	29	279	9.2
8,000	30	288	15.0	28	275	13.7	27	304	12.3	28	274	10.5
10,000	29	283	20.6	26	268	14.5	22	299	15.5	27	274	12.8
12,000	25	277	27.8	25	272	14.2	19	288	19.5	26	276	16.0
14,000	22	282	26.7	24	268	13.6	14	295	19.8	21	280	16.0
16,000	18	296	12.8	19	271	8.4	12	291	10.6	19	288	11.5
18,000	16	312	2.3	15	274	7.0				10	301	7.8
20,000	10	81	6.1									

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	37	0.7	31	290	0.4	31	291	1.0	30	35	0.5
500	--	---	----	31	270	2.0	30	293	2.9	30	74	.2
1,000	--	---	----	31	314	3.9	29	300	4.4	30	202	.8
1,500	31	32	.6	31	319	4.6	29	311	5.3	30	267	2.6
2,000	31	273	2.6	31	318	4.8	29	315	5.6	28	296	4.3
2,500	31	259	4.0	31	318	5.8	29	316	5.1	28	298	4.7
3,000	31	259	4.7	31	318	6.4	29	313	6.1	27	315	5.2
4,000	31	250	4.8	31	306	6.5	29	295	7.4	25	309	7.4
5,000	31	240	6.5	30	306	9.3	26	283	9.9	25	300	9.8
6,000	31	255	7.7	29	300	10.3	26	281	11.2	24	296	11.1
8,000	29	258	8.1	26	305	12.6	23	301	12.2	22	299	11.6
10,000	25	264	8.5	22	291	15.4	19	293	13.9	19	291	15.1
12,000	17	262	10.7	14	295	13.5	14	309	14.5	16	306	19.9
14,000	15	253	9.1	14	305	12.5	12	309	11.6	13	323	12.2
16,000	13	255	7.3	11	271	11.8	10	267	3.6	10	313	7.2
18,000	11	224	2.6							10	338	3.5
20,000												

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	221	0.6	31	321	3.2	31	239	0.2	31	189	0.4
500	31	218	2.9	30	315	3.5	31	337	1.3	30	290	2.5
1,000	31	213	3.2	30	321	3.6	31	342	1.9	30	306	3.6
1,500	31	217	3.8	30	279	1.8	31	328	2.7	30	308	3.3
2,000	31	240	3.6	30	232	2.6	31	331	3.6	30	307	4.2
2,500	30	264	1.9	31	231	3.5	31	318	4.0	30	298	3.9
3,000	30	276	6.7	31	247	4.2	31	312	4.6	30	289	4.5
4,000	30	287	7.7	31	258	5.8	31	303	5.3	28	267	6.4
5,000	29	297	8.8	31	262	7.8	30	286	7.6	24	261	7.1
6,000	28	293	12.7	30	266	11.3	30	286	11.0	23	254	7.7
8,000	23	284	12.8	24	267	12.8	29	279	15.4	19	230	8.3
10,000	22	272	16.6	19	286	16.2	29	280	20.2	17	228	11.6
12,000	21	280	17.1	13	288	20.3	26	274	28.1	12	264	15.8
14,000	17	284	19.5				21	283	27.2			
16,000	13	280	12.5				13	287	16.4			
18,000												
20,000												

Altitude (meters) m.s.l.	Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	270	0.5	31	276	3.7	27	142	4.0	31	63	1.9
500	31	293	2.5	30	278	4.9	22	139	4.3	--	---	----
1,000	31	293	3.4	30	287	4.5	21	166	5.3	31	72	1.8
1,500	31	293	3.5	30	294	3.4	21	229	3.2	31	116	1.5
2,000	31	292	3.8	30	302	3.1	22	270	5.0	30	322	.8
2,500	31	296	4.6	30	304	2.7	22	276	7.8	29	315	2.9
3,000	31	292	5.4	30	304	2.7	22	288	9.3	29	306	4.2
4,000	31	299	8.5	31	299	4.6	22	290	10.3	29	297	6.7
5,000	31	300	10.1	31	295	6.1	24	284	13.4	28	288	9.0
6,000	31	293	11.9	31	290	8.6	24	286	12.6	26	276	9.4
8,000	28	282	12.3	28	290	11.1	22	278	13.6	26	271	12.1
10,000	24	291	14.6	26	292	13.1	20	270	18.8	23	258	12.6
12,000	20	286	15.2	20	273	14.3	17	269	19.2	22	253	12.4
14,000	19	286	15.1	10	263	16.5	15	274	22.2	16	248	7.2
16,000	14	305	13.9				13	271	12.0	12	256	7.7
18,000												
20,000												

Altitude (meters) m.s.l.	San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	119	5.1	31	154	2.9	31	78	0.8	31	273	2.9
500	31	135	8.1	30	118	5.0	28	63	1.2	31	313	3.5
1,000	29	145	8.1	30	122	5.6	27	275	.4	31	333	3.3
1,500	29	162	5.4	29	118	4.1	25	313	1.5	31	351	2.3
2,000	29	183	3.9	29	113	3.2	26	294	3.3	31	6	1.9
2,500	29	210	3.1	30	127	3.1	25	307	3.7	31	325	2.6
3,000	29	226	2.8	30	128	2.1	26	311	3.9	31	295	3.6
4,000	29	255	3.9	30	171	2.7	27	292	5.7	31	287	6.1
5,000	28	282	4.6	28	149	3.2	27	288	6.9	30	289	9.1
6,000	27	283	7.0	27	230	6.2	28	282	8.4	30	285	11.7
8,000	26	278	10.4	27	242	7.7	26	268	8.8	27	279	11.7
10,000	24	279	15.8	25	254	10.8	26	275	10.9	25	279	14.9
12,000	22	271	19.6	23	275	15.4	22	280	13.6	23	284	16.4
14,000	14	272	18.9	19	289	16.2	22	281	10.9	22	264	18.0
16,000				14	281	10.8	22	287	7.8	22	266	11.3
18,000				13	252	3.1	17	296	4.5	22	250	5.7
20,000										17	240	.5

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	347	0.7	31	227	2.1	31	234	2.8
500	31	358	1.5	--	--	----	31	256	3.6
1,000	31	311	2.1	31	240	2.9	31	248	3.2
1,500	30	310	3.2	31	255	3.8	31	234	2.4
2,000	29	310	3.6	31	254	3.7	31	235	2.3
2,500	28	321	4.9	30	256	3.1	31	235	2.6
3,000	28	323	5.5	29	250	3.2	31	240	2.9
4,000	27	322	7.8	29	262	1.9	31	236	1.1
5,000	24	326	8.7	29	215	5.2	31	239	7.5
6,000	24	325	9.6	29	217	6.5	30	253	9.2
8,000	20	319	11.0	27	252	8.1	26	239	7.4
10,000	15	292	16.3	23	283	3.3	22	248	11.8
12,000				21	221	5.5	15	236	9.0
14,000				19	231	2.9	14	211	5.0
16,000				15	197	2.9	12	203	5.6
18,000				10	162	1.0			

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30.—Solar radiation intensities, tabulated in langleys per minute.

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
TABLE MOUNTAIN, CALIF.											
	Air mass										
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
May										*Mb.*	*Mb.*
20	—	—	—	1.33	—	—	—	—	—		
24	—	—	—	1.36	—	—	—	—	—		
25	1.06	1.15	1.25	1.37	—	—	—	—	—		
Averages	1.06	1.15	1.25	1.35	—	—	—	—	—		
Departures	+.01	.00	−.01	−.04	—	—	—	—	—		
LINCOLN, NEBR.											
	Air mass										
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
May										*Mb*	*Mb.*
3	—	—	—	—	1.37	—	—	—	—	10.2	9.1
7	—	—	—	—	1.41	1.14	0.97	0.84	0.73	6.4	6.9
11	—	—	—	—	1.37	1.06	.88	[illegible]	.67	8.1	6.6
12	—	—	—	—	1.34	1.01	.79	.67	.58	8.7	9.4
22	—	—	—	—	1.45	1.23	1.10	.99	.92	[illegible]	10.2
23	—	—	—	—	1.39	1.14	.99	.86	.71	10.2	9.8
26	—	—	—	—	1.35	1.03	.86	.71	.56	9.1	6.6
Averages	—	—	—	—	1.38	1.10	.93	.80	.70		
Departures	—	—	—	—	+.01	−.02	+.03	+.01	+.03		
MADISON, WIS.											
	Air mass										
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
May										*Mb*	*Mb.*
3	0.32	0.44	0.58	0.79	—	—	—	—	—	11.8	9.8
5	—	—	.87	—	—	—	—	—	—	7.5	7.8
7	.75	.84	.96	1.13	1.37	—	—	—	—	7.8	8.1
8	.70	.80	.92	1.08	1.34	—	—	—	—	9.8	8.7
12	.59	.66	.79	.98	1.21	—	—	—	—	7.5	[illegible]
21	.68	.76	.90	1.08	—	—	—	—	—	12.7	9.8
24	.74	.84	.92	1.11	1.36	1.02	—	—	—	11.0	11.0
30	—	—	.80	.98	—	—	—	—	—	15.8	15.3
Averages	.63	.72	.84	1.02	1.32	1.02	—	—	—		
Departures	+.01	−.04	−.09	−.07	−.04	−.02	—	—	—		
BOSTON, MASS.											
	Air mass										
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
										Mb	*Mb.*
	No data during May 1951										

*Extrapolated

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

Date	Sun's zenith distance									Vapor pressure, EST	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
TACUBAYA, D. F., MEXICO											
	Air mass										
	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
May										*Mb*	*Mb*
1	0.21	0.33	—	0.60	—	—	—	—	—	9.2	8.7
7	.37	.51	—	.75	—	—	—	—	—	9.1	7.4
9	.17	.16	—	.41	—	—	—	—	—	9.9	8.1
10	.23	.29	.43	.45	—	—	—	—	—	8.8	7.2
11	.19	.30	.40	.53	—	—	—	—	—	[illegible]	[illegible]
12	.13	.25	.40	.48	—	—	0.48	0.29	0.20	9.9	9.1
[illegible]	—	—	—	[illegible]	—	—	.35	—	—	12.7	8.8
22	.42	.44	.59	.67	—	—	—	—	—	11.2	[illegible]
23	.48	.44	.63	.80	—	—	—	—	—	[illegible]	[illegible]
24	.51	.57	.77	[illegible]	—	1.24	1.01	.87	.78	12.7	6.9
25	.55	.69	.83	.75	—	—	—	—	—	8.7	8.7
26	.37	.53	.57	.58	—	—	—	—	—	10.3	[illegible]
28	.65	.75	.88	1.10	—	—	—	—	—	9.7	[illegible]
Averages	.36	.44	.61	.66	—	1.24	.61	.58	.49		
Departures	.00	−.01	.00	−.05	—	[illegible]	−.10	[illegible]	[illegible]		
BLUE HILL, MASS.											
	Air mass										
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
May										*Mb*	*Mb*
1	0.94	1.02	1.13	1.24	—	—	—	—	—	5.4	3.9
3	—	—	—	1.29	1.49	—	—	—	—	2.9	5.0
4	—	—	—	—	—	1.26	1.08	0.94	0.82	[illegible]	3.9
5	.86	.96	1.09	1.25	1.49	1.24	1.06	.90	.78	5.8	4.4
6	.81	[illegible]	1.07	1.21	—	—	—	—	—	6.8	[illegible]
9	.73	.85	1.01	1.18	—	—	—	—	—	8.6	8.4
[illegible]	—	—	—	1.22	1.49	—	—	—	—	6.5	4.8
13	—	—	—	—	1.49	1.24	1.07	.95	.83	8.4	4.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	[illegible]	—	[illegible]	4.8	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	—	—	—	—	—	—	[illegible]	[illegible]
18	—	—	—	—	—	1.17	1.02	.90	.61	9.4	9.0
19	—	—	—	—	—	1.07	.91	.80	.70	9.9	10.4
[illegible]	.71	.82	.99	1.10	1.35	.97	.82	.70	—	11.3	11.3
28	—	—	—	—	—	—	.76	.64	.54	15.2	15.8
[illegible]	—	—	—	—	—	—	.88	.74	.64	12.5	14.8
Averages	.74	.85	[illegible]	1.20	1.46	1.16	.95	.82	.70		
Departures	+.06	[illegible]	+.03	+.10	+.08	+.09	+.06	+.07	+.05		
ALBUQUERQUE, N.M.											
	Air mass										
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
May										*Mb*	*Mb*
2	0.72	0.86	1.06	1.26	1.50	—	1.21	1.10	1.02	4.4	2.1
3	1.06	1.15	1.29	1.43	1.60	—	—	—	—	2.3	1.6
4	.98	—	—	—	—	1.36	—	—	—	1.5	2.2
7	—	—	.79	1.02	1.22	.98	—	.56	.42	5.0	3.8
8	.80	.90	1.03	1.21	1.39	—	—	—	—	4.2	2.2
9	.79	.93	1.08	1.22	1.44	1.33	1.16	.97	.89	3.0	2.1
10	.76	.89	—	1.21	1.48	—	—	—	—	5.0	3.3
11	.67	.82	.98	1.14	1.41	—	—	—	—	5.6	3.5
15	—	—	—	1.30	1.50	—	—	—	—	4.4	1.6
18	.88	.98	1.11	1.30	1.48	—	—	—	—	6.3	3.8
19	.85	.95	1.11	1.28	1.48	—	—	—	.81	5.0	4.2
20	—	.86	—	1.13	1.33	—	—	—	—	3.3	4.0
21	.78	—	—	—	—	—	—	—	.71	[illegible]	[illegible]
22	.84	.94	1.09	1.28	1.50	1.26	1.09	.95	—	6.5	5.0
24	.91	1.01	—	—	—	—	—	—	—	[illegible]	[illegible]
25	.93	1.03	1.16	1.33	1.54	1.22	.99	.68	.51	4.6	3.3
26	1.00	1.10	1.23	1.36	1.55	1.35	1.22	1.10	[illegible]	[illegible]	[illegible]
27	.88	.99	1.11	1.31	1.51	1.29	1.14	1.04	.95	6.0	2.5
28	—	—	1.02	1.21	1.41	—	—	—	—	6.8	2.3
Averages	.86	.96	1.08	1.25	1.46	1.26	1.14	.91	.79		
Departures	+.02	+.04	+.04	+.05	−.02	+.02	+.01	−.07	−.12		

SOLAR RADIATION DATA

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	30	1	2	3	4	5	6	Average	7	8	9	10	11	12	13	Average	14	15	16	17	18	19	20	Average
Langleys	427	315	322	301	272	304	259	314	228	267	286	317	34	154	301	227	290	288	295	139	158	285	130	226
Date	21	22	23	24	25	26	27	Average	28	29	30	31	1	2	3	Average								
Langleys	230	246	151	26	49	277	100	154	213	200	101	209	255	174	179	190								

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	30	1	2	3	4	5	6	Average	7	8	9	10	11	12	13	Average	14	15	16	17	18	19	20	Average
Langleys	111	110	129	126	122	121	126	121	124	165	117	105	28	113	142	114	136	138	147	131	125	153	135	138
Date	21	22	23	24	25	26	27	Average	28	29	30	31	1	2	3	Average								
Langleys	145	148	104	26	65	154	101	106	154	181	96	185	156	170	147	155								

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	30	1	2	3	4	5	6	Average	7	8	9	10	11	12	13	Average	14	15	16	17	18	19	20	Average
Langleys	72	81	---	144	154	73	148	112	164	206	131	88	40	189	104	132	90	113	188	212	148	196	236	169
Date	21	22	23	24	25	26	27	Average	28	29	30	31	1	2	3	Average								
Langleys	248	243	179	32	80	119	173	153	188	240	168	231	165	271	288	222								

Note.–Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1951	Aklavik, Mackenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Bethel, Alaska	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Is., Pac.Area	Caribou, Me.	Charleston, S.C.	Cleveland, Ohio	Columbus, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Inyokern, Calif.	Ithaca, N.Y.	Keflavik, Iceland	Lake Charles, La.
April 30		464		687	---	317	735	633	673	675	(393)	772	703	569	452	606	335	671	76	(442)	323	237	327	663	529	297	308	545	620		396	818	730	560	722
May 1		435		706	639	440	708	344	636	473	(343)	741	(480)	550	633	514	523	669	221	781	357	488	720	744	588	265	431	417	668		346	807	722	217	474
May 2		698		701	689	151	676	675	641	456	(513)	544	619	565	499	245	446	606	74	793	745	605	753	532	549	269	652	543	640		692	772	682	610	368
May 3		778		687	603	273	660	551	662	434	(637)	542	667	345	625	246	422	583	262	(790)	694	603	672	533	590	704	801	506	664		578	617	315	477	522
May 4		749		672	---	309	600	452	593	706	---	504	676	424	412	511	485	452	523	761	696	(563)	757	624	601	685	653	513	613		698	769	727	249	713
May 5		741		714	650	561	737	619	671	715	(240)	439	699	708	611	288	461	630	558	696	570	594	662	375	657	683	733	338	687		521	369	732	226	711
May 6		588		683	662	583	578	486	553	672	(654)	550	(680)	589	464	660	435	565	687	558	695	601	409	737	679	729	448	422	697		674	801	626	668	598
Averages		636		686	649	377	671	537	633	590	---	585	(646)	536	528	438	444	596	343	(689)	583	(527)	614	601	599	519	575	469	656		558	708	648	430	587
Departures		-14		+53	---	-64	+202	+52	+216	---	---	+109	+30	---	---	-168	+74	+148	-76	-12	---	+90	+15	-29	+45	-67	+30	---	00		-34	+3	+223	---	+37
May 7		756		670	763	640	484	287	439	540	(667)	410	(720)	646	652	623	(486)	415	702	692	611	569	(444)	735	623	732	692	581	790		670	787	262	391	331
May 8		703		409	663	643	566	609	524	642	(636)	229	(670)	671	659	710	(611)	476	616	762	557	(591)	659	738	598	669	444	659	661		736	793	568	100	238
May 9		776		288	716	628	648	708	623	638	(587)	215	563	426	598	686	(356)	636	672	778	782	500	590	735	586	686	376	609	630		724	799	559	411	539
May 10		730		537	659	657	736	689	---	493	(498)	533	711	81	277	630	60	657	537	746	725	625	737	686	646	732	488	606	697		464	784	631	126	635
May 11		745		436	---	599	54	120	---	179	---	710	611	111	132	683	73	99	220	671	465	(581)	774	768	592	765	716	526	464		752	827	107	259	574
May 12		705		477	---	(541)	294	164	---	335	---	108	750	698	718	632	550	299	622	781	814	(552)	589	677	460	664	530	460	821		459	721	248	287	671
May 13		495		701	---	417	758	676	712	252	(673)	508	745	774	722	619	652	438	283	709	516	407	675	462	628	608	530	670	786		477	513	792	235	728
Averages		701		503	700	(589)	506	465	575	440	---	388	(681)	487	537	655	(398)	431	522	734	638	(547)	(638)	686	590	694	539	587	693		612	746	452	258	531
Departures		+33		-96	---	+96	+29	-69	+129	---	---	-90	+33	---	---	00	+5	-34	+69	-3	---	+90	+55	+30	+16	+43	+2	---	+7		-40	00	+11	---	-35
May 14		633		712	---	405	735	629	678	598	(669)	549	705	715	700	750	595	697	449	810	762	359	353	770	561	772	422	655	784		669	807	751	(227)	412
May 15		668		729	---	349	707	727	633	490	---	312	738	706	695	688	595	657	577	789	306	457	142	742	640	694	501	652	746		595	817	701	336	571
May 16		706		708	681	(361)	641	723	598	580	(592)	279	712	718	711	694	567	584	405	778	631	585	379	720	700	780	689	571	731		742	791	689	228	661
May 17		299		725	674	428	298	585	232	457	---	485	(592)	564	507	655	182	322	374	795	726	549	476	729	675	714	417	625	704		618	804	334	533	727
May 18		776		747	631	(503)	407	745	---	652	---	789	522	622	(651)	653	538	394	267	791	585	482	297	718	639	514	392	316	592		606	782	620	314	676
May 19		745		683	681	559	662	603	---	529	---	702	418	662	609	721	527	516	471	769	427	465	700	726	---	701	581	308	690		720	751	710	485	675
May 20		613		638	669	320	288	670	---	587	---	748	397	667	530	690	433	289	---	792	445	440	751	731	---	706	462	364	650		708	734	456	547	579
Averages		633		703	647	(416)	534	669	536	556	---	552	(583)	665	(629)	693	491	494	424	789	555	477	443	734	643	697	495	499	700		665	784	609	(381)	615
Departures		-42		+93	---	-24	+58	+55	+141	---	---	+67	-20	---	---	+69	+113	+60	-51	+21	---	+3	-87	+82	+64	-6	-32	---	+30		+40	+18	+183	---	+35
May 21		688		700	598	418	513	739	---	720	572	453	631	598	633	744	463	532	---	809	201	600	630	741	500	778	368	547	621		746	497	574	189	617
May 22		748		611	644	275	583	736	---	632	(427)	336	722	255	403	689	80	643	---	752	699	686	664	706	695	782	762	615	641		714	790	735	209	645
May 23		689		507	---	(325)	366	545	---	603	---	112	531	635	556	715	678	424	---	650	508	303	785	733	---	756	688	351	334		718	762	112	225	664
May 24		726		759	778	257	33	694	30	298	---	256	774	404	490	733	495	107	---	741	787	306	280	754	---	703	482	690	803		587	803	690	354	351
May 25		799		366	614	328	84	759	88	494	---	777	499	735	741	718	609	162	---	786	776	476	(354)	733	---	627	634	593	699		756	808	773	265	299
May 26		790		123	460	279	741	739	740	760	---	590	147	433	327	608	363	702	---	(792)	460	518	764	702	---	783	(526)	313	200		761	805	703	184	622
May 27		773		648	622	490	194	343	223	741	(629)	606	644	350	329	694	190	237	---	785	748	541	681	659	---	649	591	592	815		756	788	366	174	705
Averages		731		631	618	(339)	359	651	270	607	---	447	564	487	497	700	411	401	---	(759)	597	490	(594)	719	---	725	(579)	529	588		720	751	565	229	558
Departures		+33		-82	---	-22	-100	-15	-141	---	---	-27	-35	---	---	+52	+18	-67	---	-5	---	+42	+29	+48	---	+59	+31	---	-55		+75	-29	+80	---	-39
May 28		782		724	681	(558)	512	802	411	767	(498)	208	752	363	215	726	152	544	---	792	608	564	710	771	612	566	(762)	371	799		762	816	344	194	639
May 29		617		738	686	268	449	711	353	709	---	134	715	596	556	719	545	658	---	687	790	547	772	740	696	756	545	619	770		739	839	226	116	724
May 30		624		663	620	382	201	599	249	713	---	260	702	742	728	782	590	194	---	661	784	704	768	784	628	388	(741)	641	674		743	855	708	306	725
May 31		633		620	706	498	593	742	509	624	---	688	644	682	687	751	474	549	---	695	648	615	776	766	509	305	509	659	706		724	831	776	538	734
June 1		819		630	596	283	708	779	655	664	(619)	468	687	588	670	733	507	672	---	802	515	675	623	791	632	300	295	637	490		753	844	587	430	704
June 2		826		716	645	249	412	509	389	372	(608)	611	682	559	718	751	265	462	---	816	578	660	531	767	581	512	460	602	695		622	844	107	282	483
June 3		781		714	730	221	376	701	324	---	(651)	780	615	626	575	703	304	479	---	773	821	542	234	760	538	798	(467)	566	736		739	819	521	550	587
Averages		697		686	666	(351)	464	692	413	642	---	450	685	594	593	738	405	508	---	747	678	615	630	769	599	518	(540)	585	696		726	835	467	345	657
Departures		-33		+76	---	+27	-49	+55	-28	---	---	-19	+84	---	---	+130	-26	+24	---	-4	---	+110	+30	+88	+54	-59	-74	---	+79		+93	+68	-22	---	+53

Accumulated Departures January 1 to June 3, 1951

	Aklavik, Mackenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Bethel, Alaska	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Is., Pac.Area	Caribou, Me.	Charleston, S.C.	Cleveland, Ohio	Columbus, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Inyokern, Calif.	Ithaca, N.Y.	Keflavik, Iceland	Lake Charles, La.
		-350		+245	---	-322	+4242	+413	+770	---	---	---	---	---	---	-1197	-3829	-1428	---	---	---	+4606	---	+3710	+2870	---	-651	---	---		+756	+469	+1169	---	+511

Note --Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

[illegible]—Continued

Date	Stillwater, Okla.	Swan Island, W.I.	Thule, Greenland	Toronto, Ont.	Upton, N.Y.	Wake Island, Pacific Area	Washington, D.C.	Winnipeg, Manitoba
[illegible]	591	697	545	657	683	435	482	
[illegible]	661	705	568	673	678	424	569	
[illegible]	699	551	(553)	573	602	---	669	
[illegible]	688	(670)	380	162	474	---	384	
[illegible]	[illegible]	642	537	664	672	437	(425)	
[illegible]	599	691	585	549	640	381	152	
[illegible]	402	711	625	386	(669)	515	337	
[illegible]	615	(667)	(570)	523	(631)	438	(431)	
[illegible]	+60	---	+70	+86	+35	---	---	
[illegible]	670	600	611	295	522	455	646	
[illegible]	578	495	640	616	624	208	749	
[illegible]	240	671	341	426	619	451	705	
[illegible]	266	675	436	552	641	531	521	
[illegible]	658	696	420	38	(523)	516	223	
[illegible]	419	387	637	589	503	545	314	
[illegible]	676	306	314	705	740	550	722	
[illegible]	601	546	485	460	(596)	465	554	
[illegible]	+6	---	-64	+25	+9	---	---	
[illegible]	589	596	621	614	735	530	722	
[illegible]	169	687	595	610	675	518	743	
[illegible]	[illegible]	633	646	466	634	679	680	
[illegible]	175	711	688	335	504	711	564	
[illegible]	[illegible]	[illegible]	651	707	525	694	179	
[illegible]	[illegible]	[illegible]	721	676	252	721	186	
[illegible]	496	718	655	670	(257)	662	247	
[illegible]	361	679	654	583	(526)	645	474	
[illegible]	-71	---	+49	+123	+14	---	---	
[illegible]	621	703	515	404	(412)	710	510	
[illegible]	289	692	735	242	504	681	569	
[illegible]	745	562	741	656	(428)	607	235	
[illegible]	189	594	678	637	159	698	512	
[illegible]	686	664	705	630	407	(665)	680	
[illegible]	714	683	573	527	673	699	475	
[illegible]	282	563	446	370	218	706	576	
[illegible]	503	648	628	495	400	(681)	508	
[illegible]	+36	---	-6	+48	-30	---	---	
May 28	308	392	330	298	---	700	367	
May 29	335	454	421	496	---	712	409	
May 30	503	539	678	571	423	697	762	
May 31	694	605	472	678	739	705	751	
June 1	655	676	842	347	(686)	687	(724)	
June 2	237	606	811	236	(538)	533	606	
June 3	342	697	826	326	615	550	678	
Averages	523	610	624	422	---	655	(614)	
Departures	-6	---	+19	-50	---	---	---	
[illegible]	---	---	---	-1176	+1043	---	---	

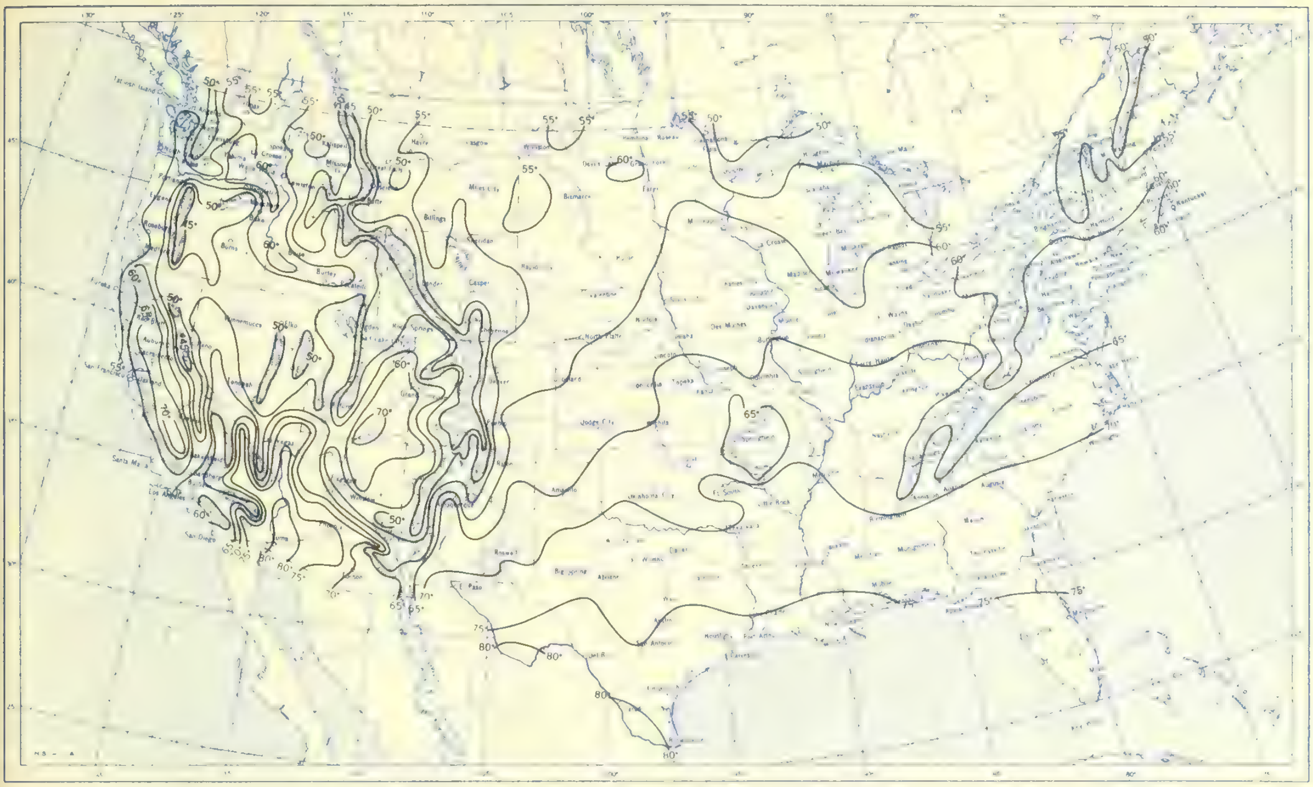
Note.--Langley is the unit used to [illegible]. Values in parentheses are interpolated.

Beginning with this issue, [illegible] 3.

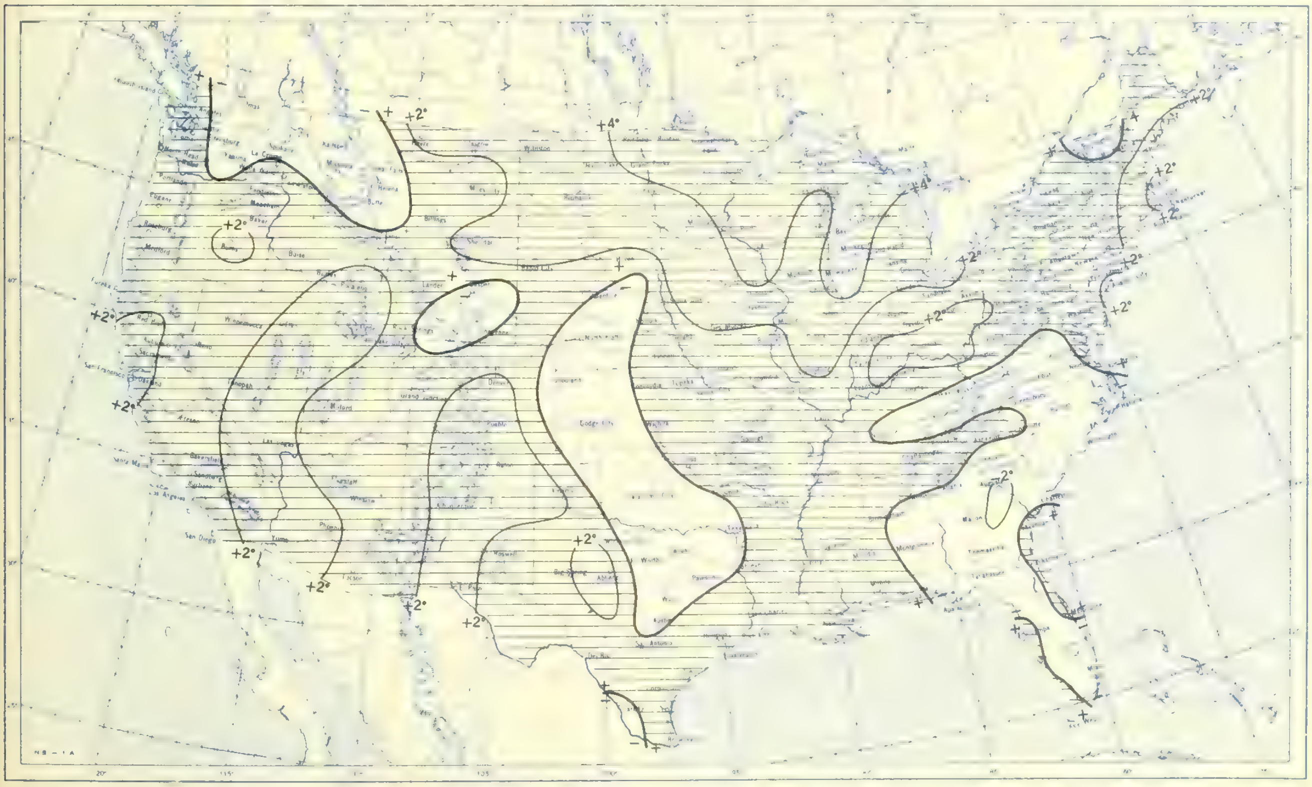
1. Little Rock, Ark.: [illegible] Equipment includes an Eppley pyrheliometer [illegible] meter is located on east parapet of first floor [illegible] south of northeast corner; exposure [illegible] [illegible] 2. Swan Island, West Indies: Latitude 17° [illegible] elevation [illegible] meters, [illegible] Brown recorder. Pyrheliometer is located on [illegible] with very good exposure. The only pollution of atmosphere is caused by [illegible] particles. A U. S. Weather Bureau station. [illegible] Thule, Greenland: [illegible] 49'W; elevation 45 meters, m.s.l. [illegible] pyrheliometer and a Brown recorder. [illegible] available, being located on the [illegible] However low lying hills adjacent to the station [illegible] direct rays of the sun during some months. A [illegible]

[illegible], New Orleans, Louisiana ---9/13/51 --- 2200

Chart I. A. Average Temperature (°F.) at Surface, May 1951.

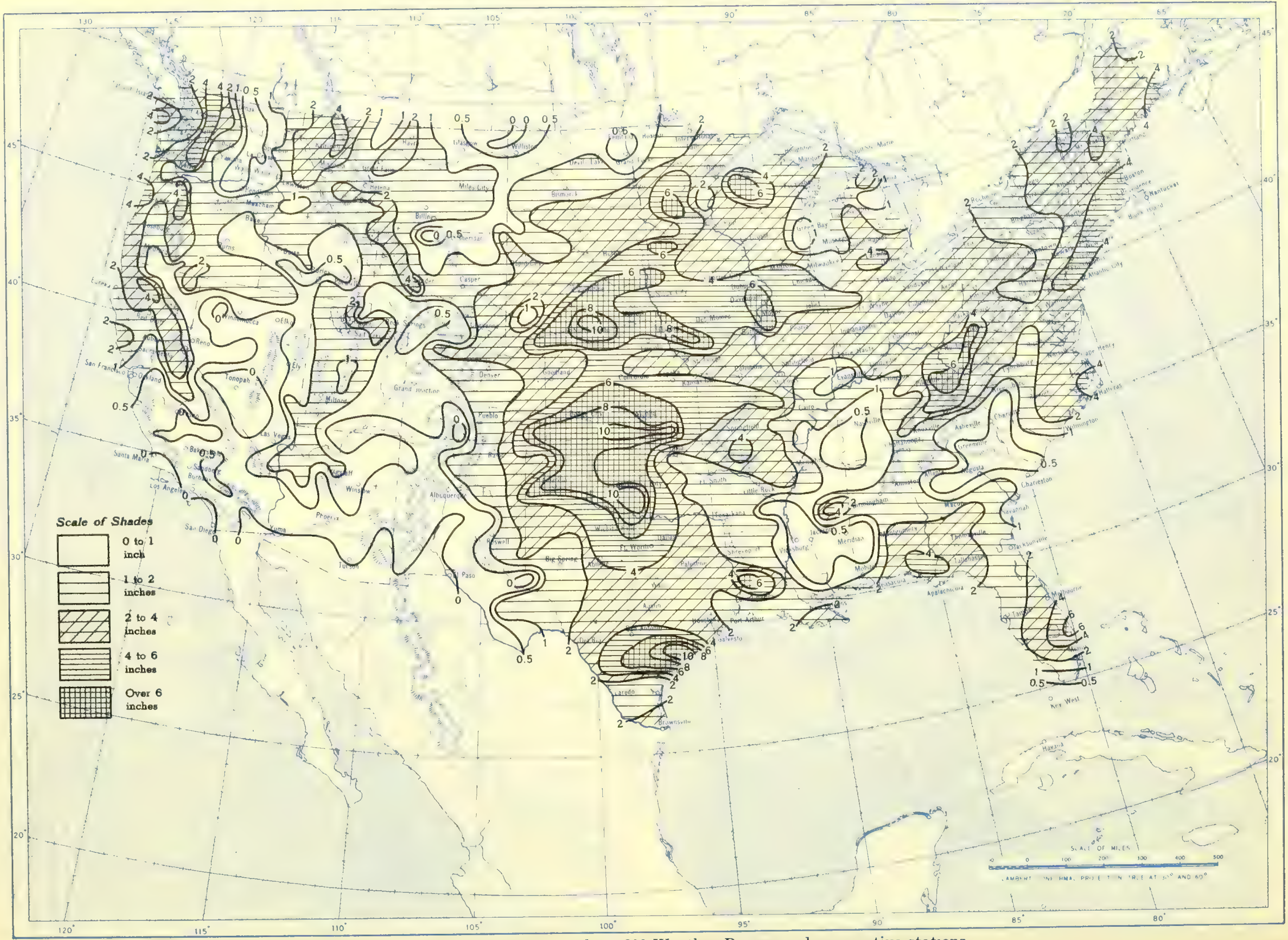


B. Departure of Average Temperature from Normal (°F.), May 1951.



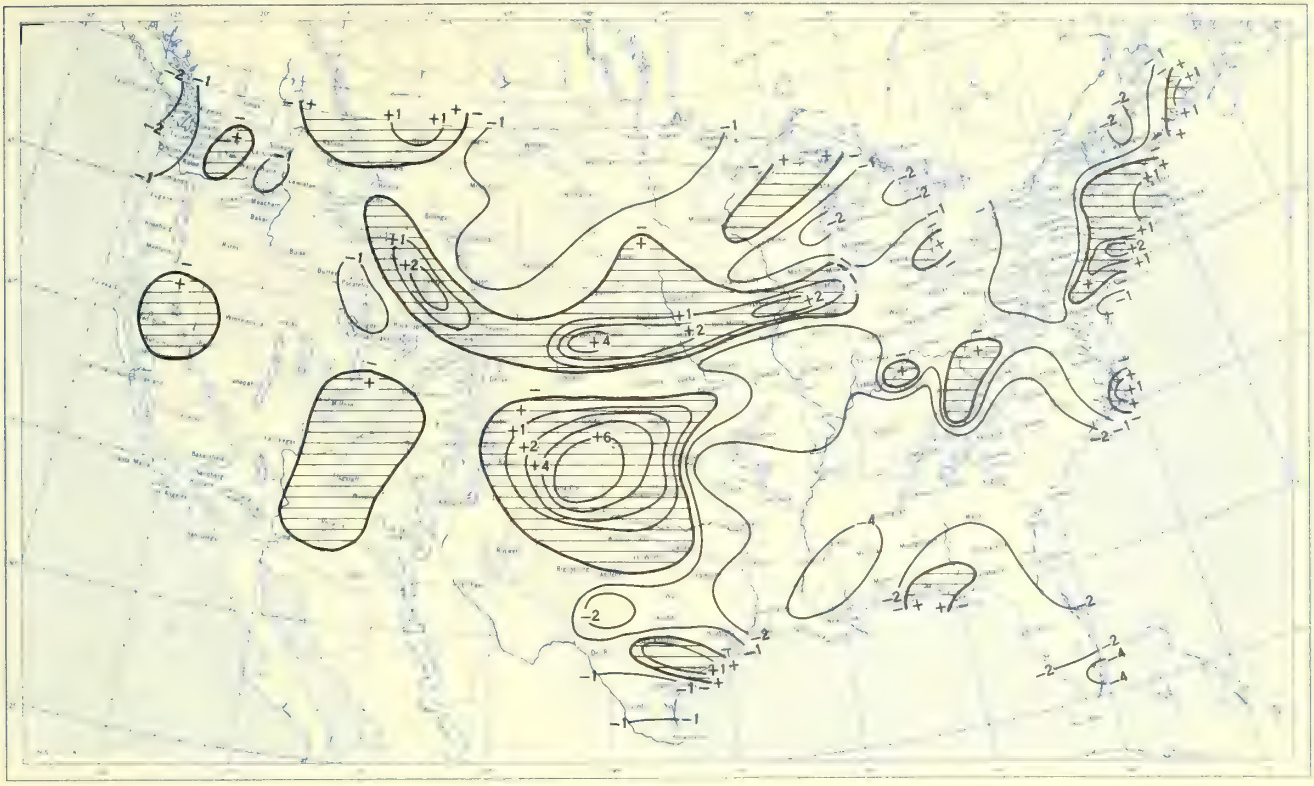
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), May 1951.

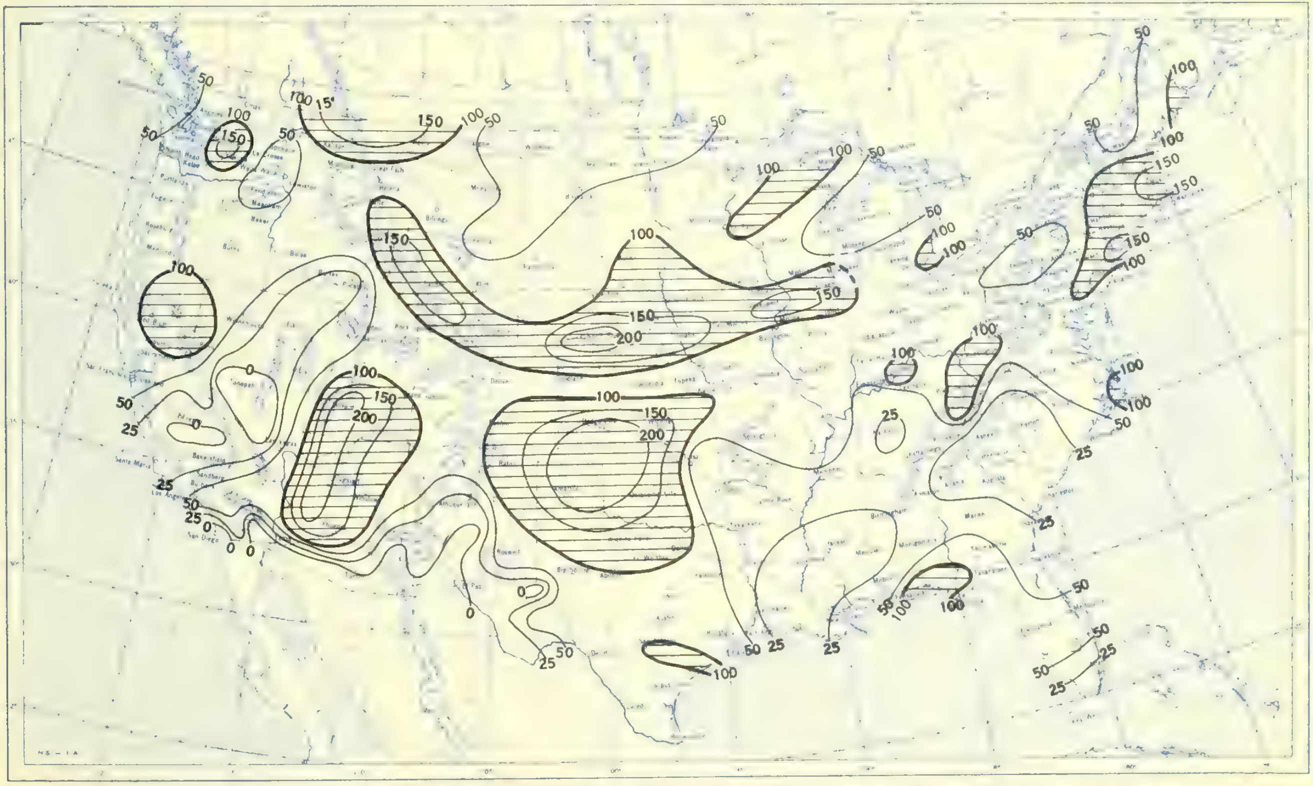


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), May 1951.

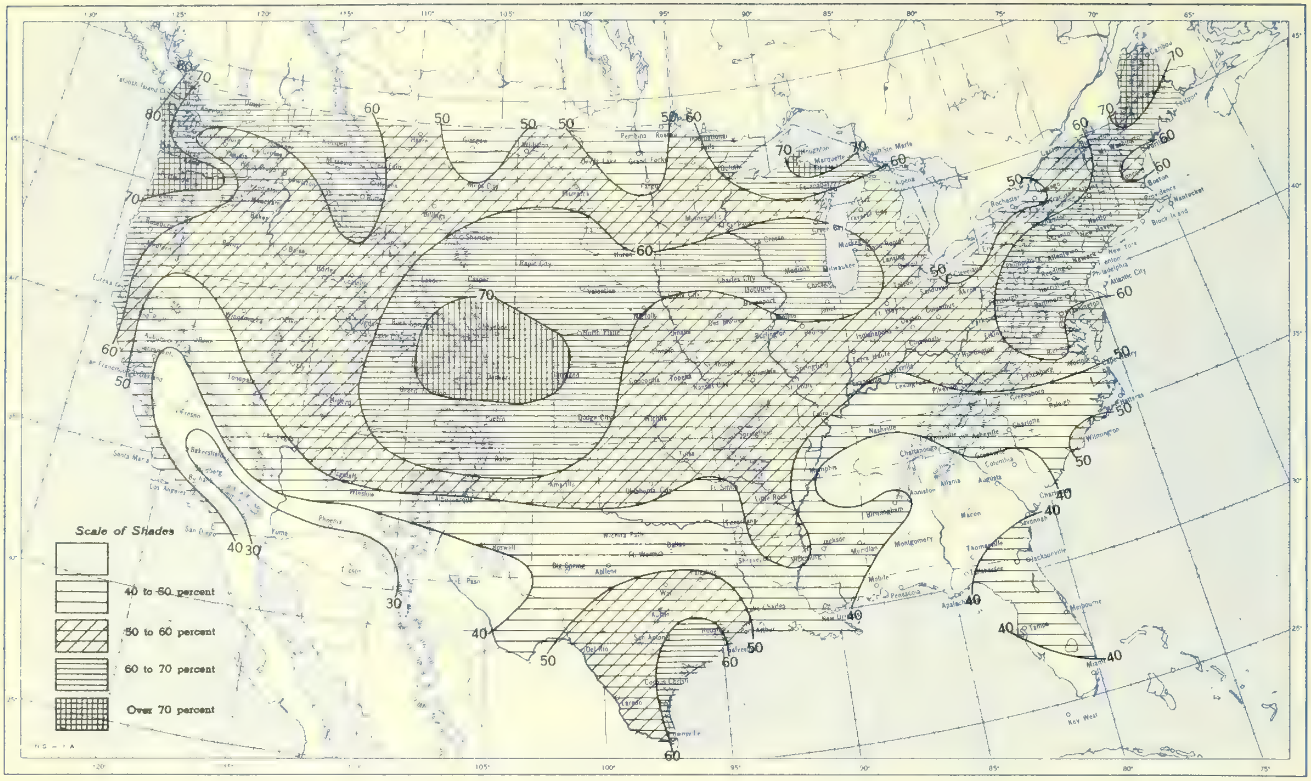


B. Percentage of Normal Precipitation, May 1951.

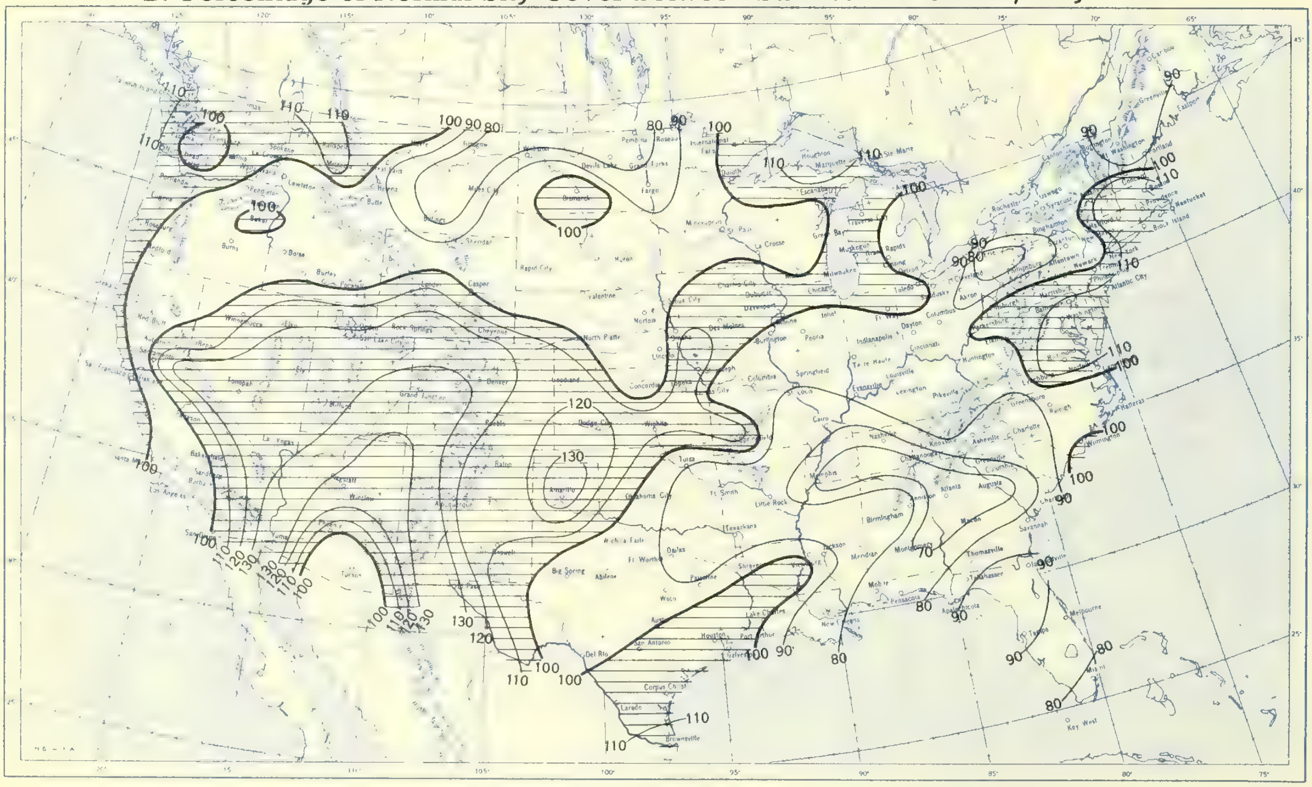


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, May 1951.

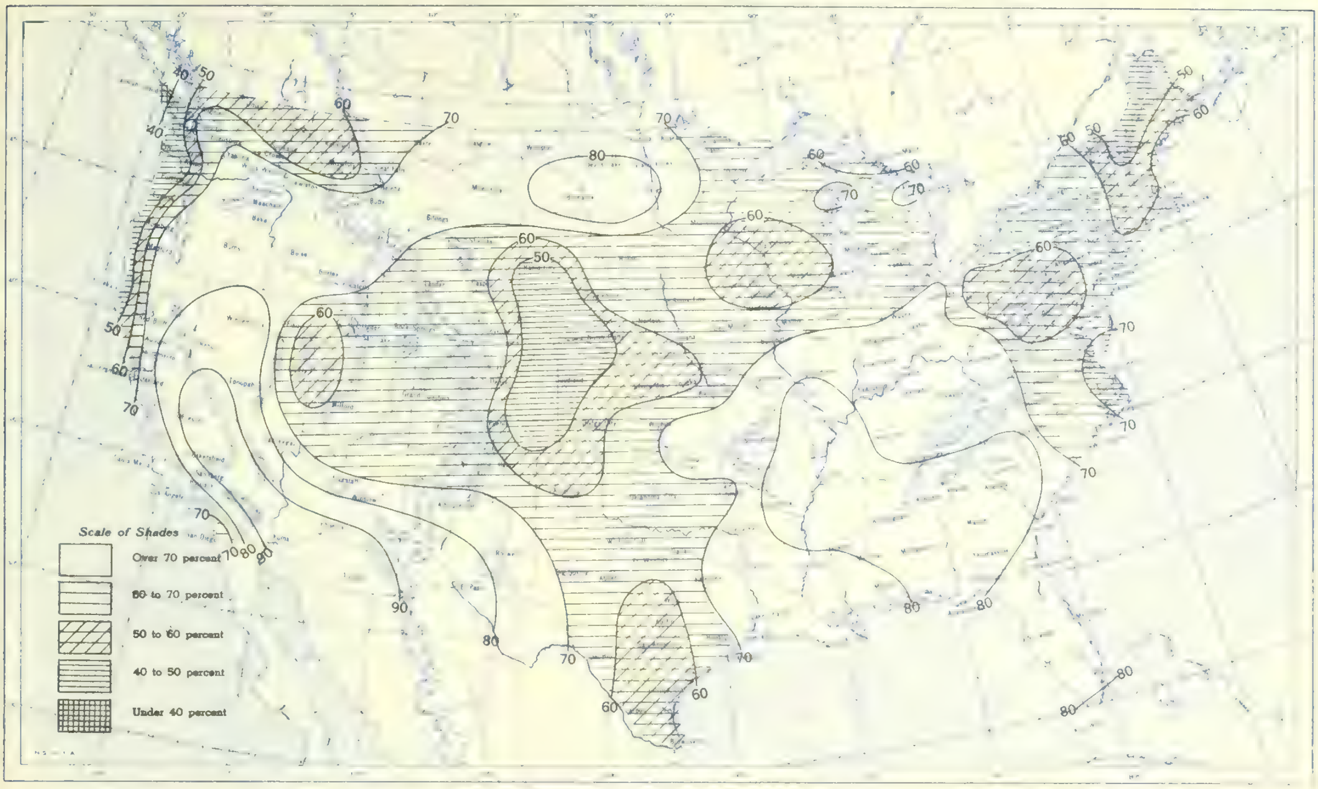


B. Percentage of Normal Sky Cover between Sunrise and Sunset, May 1951.

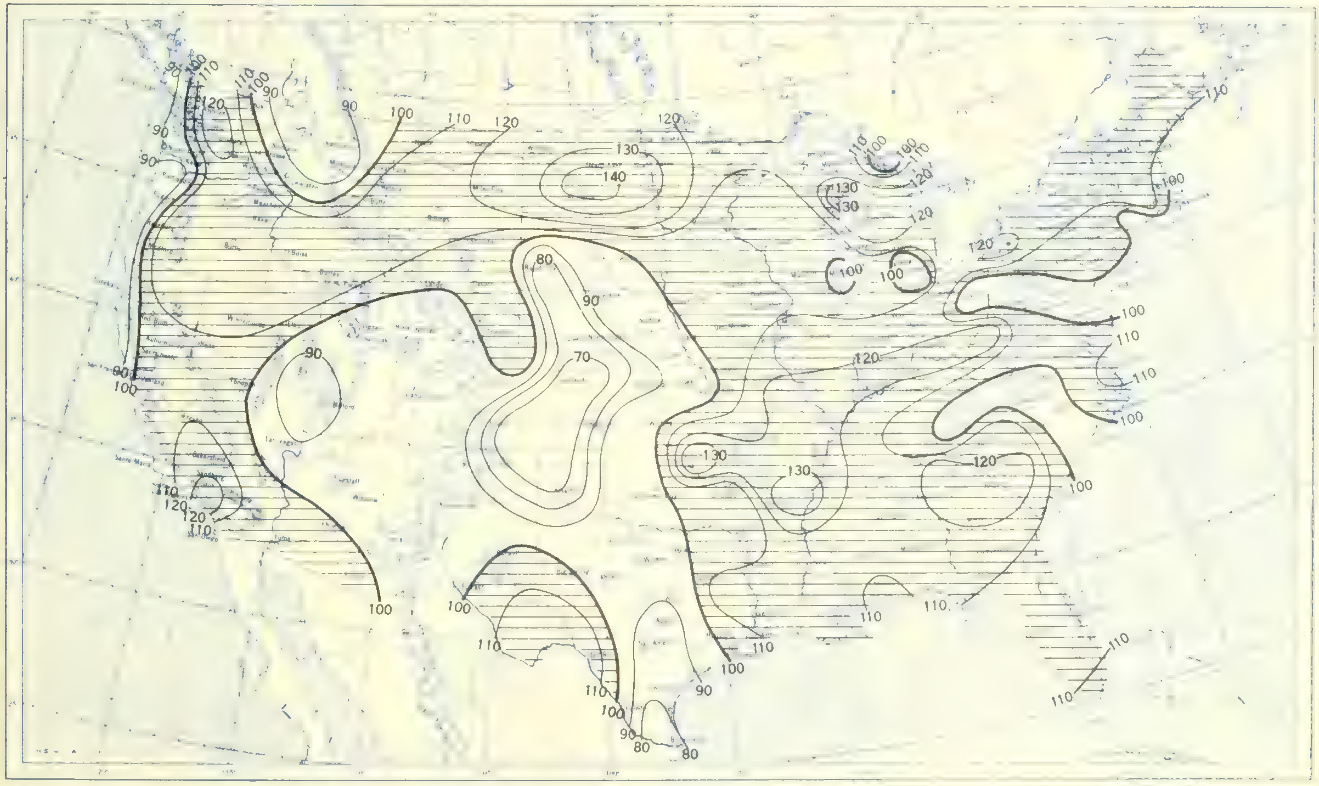


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, May 1951.



B. Percentage of Normal Sunshine, May 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, May 1951. Inset: Percentage of Normal Average Daily Solar Radiation, May 1951.

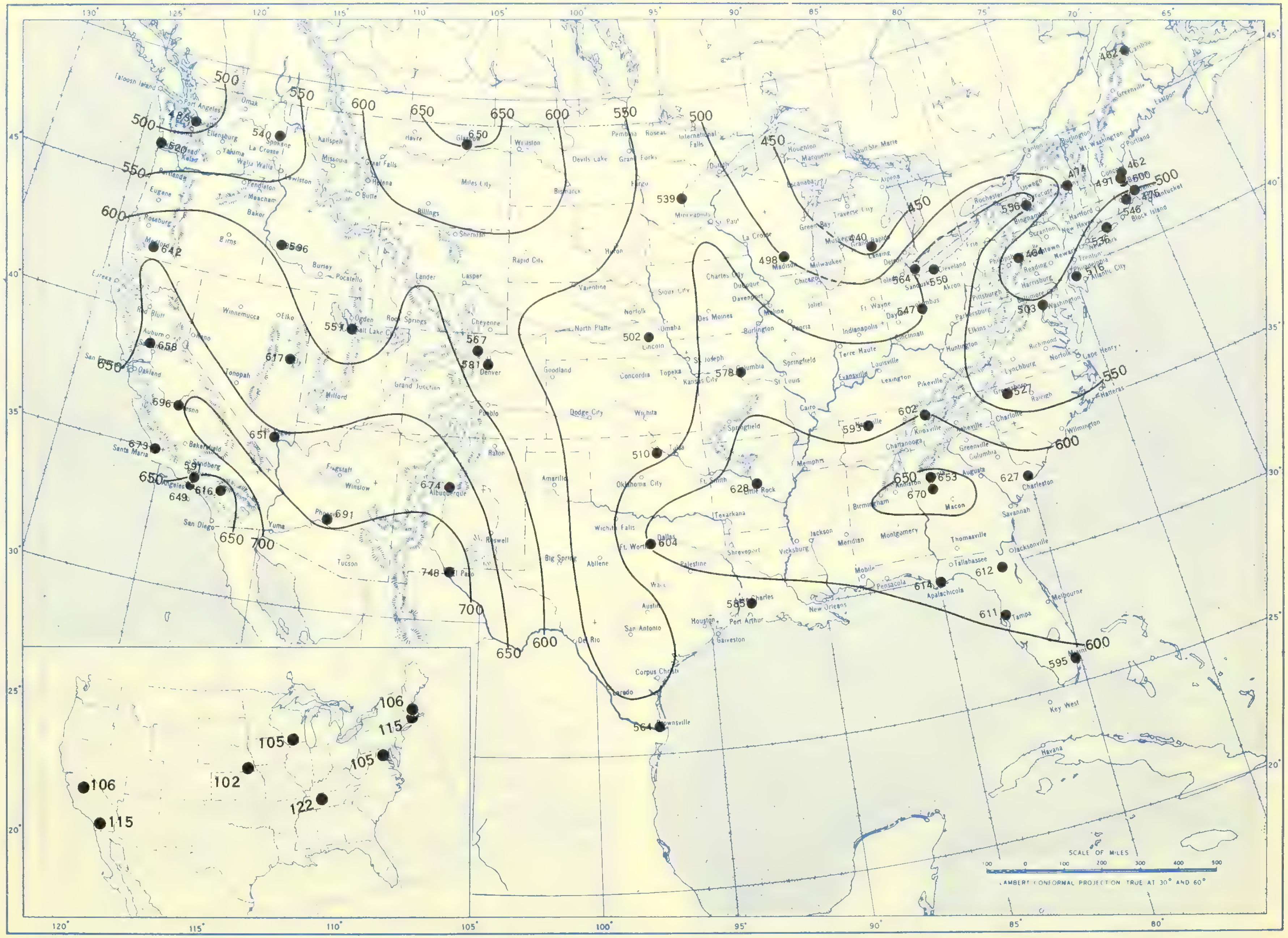
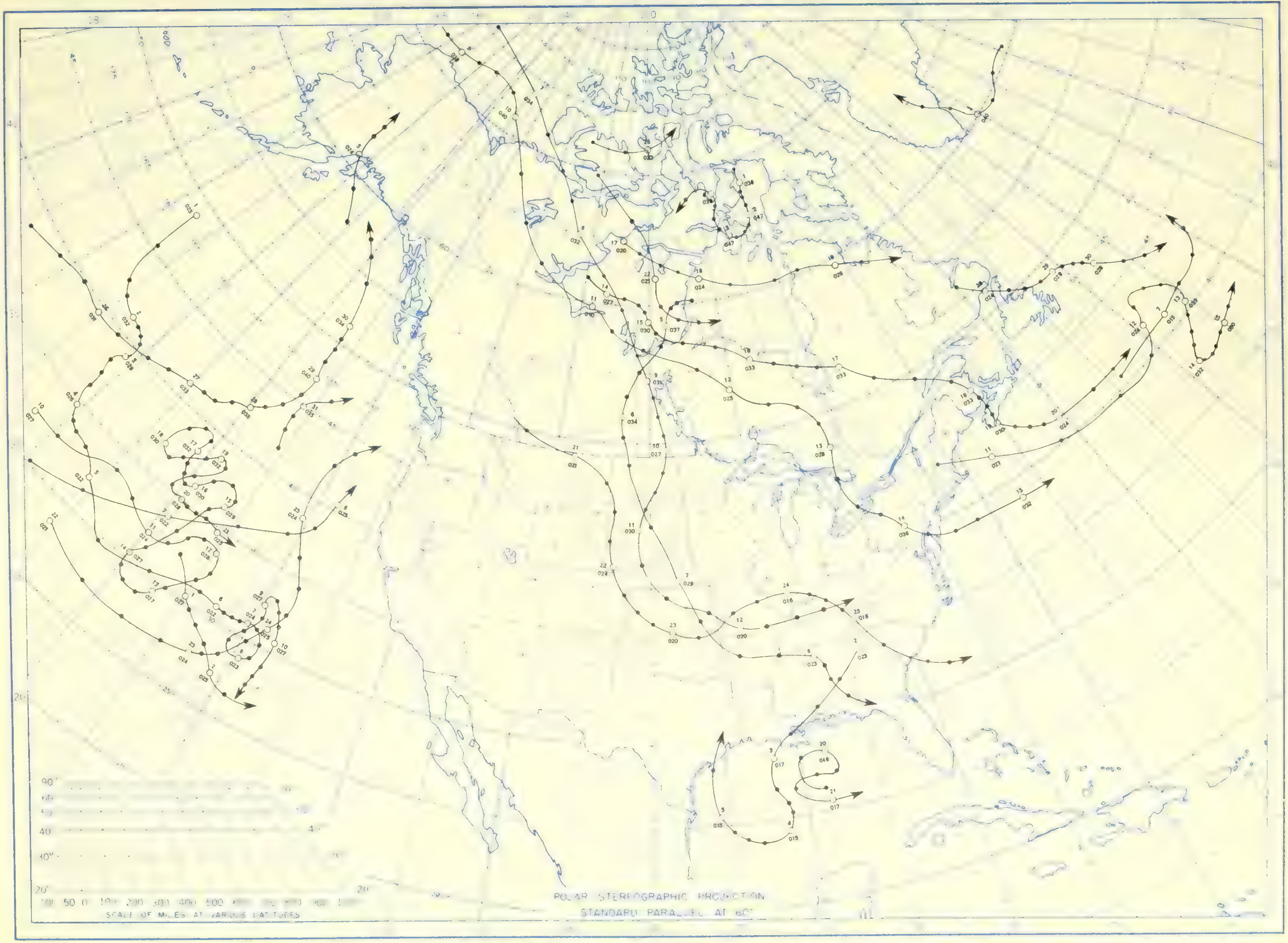


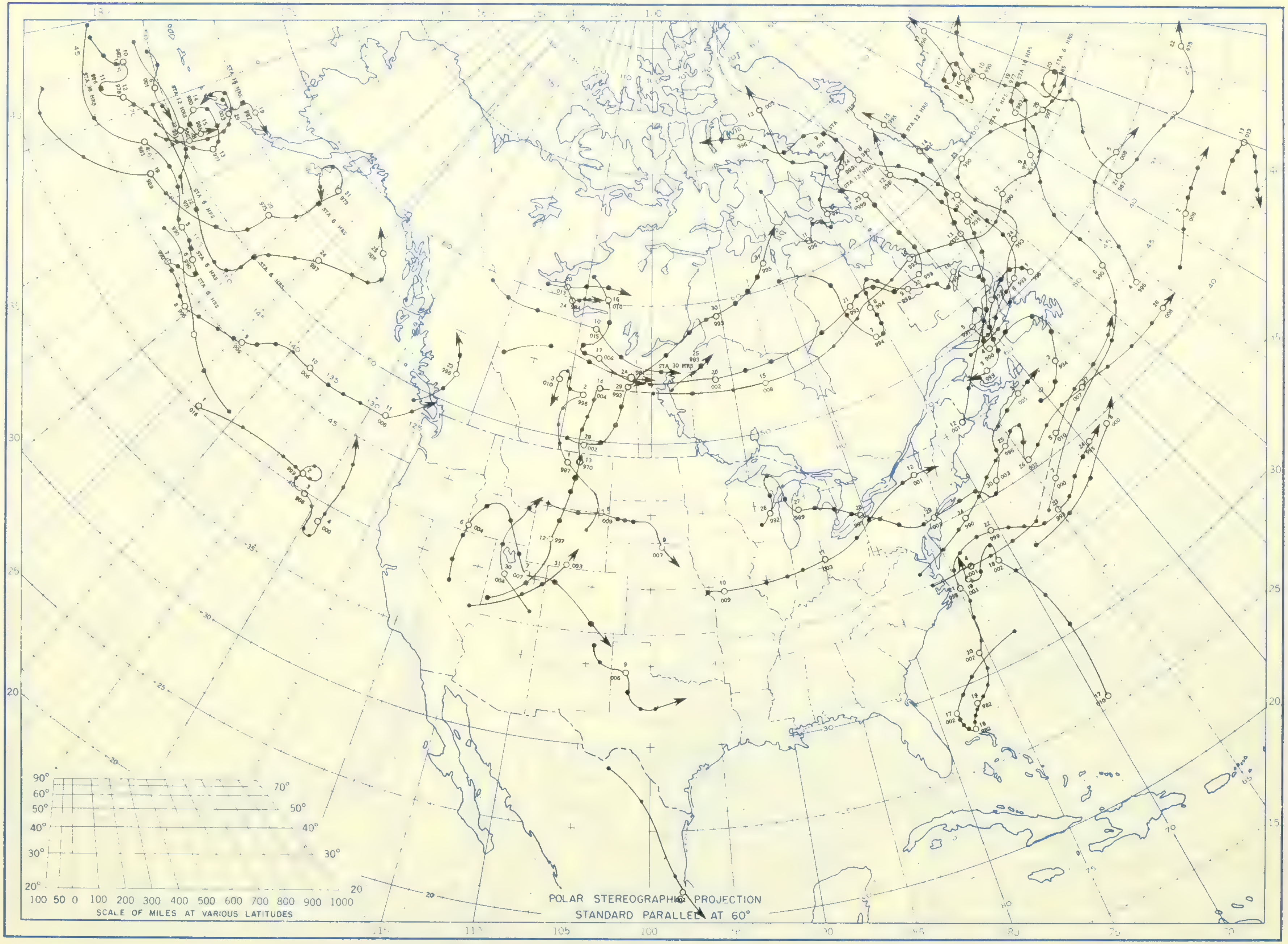
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart IX. Tracks of Centers of Anticyclones at Sea Level, May 1951


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES
90°
60°
50°
40°
30°
20°

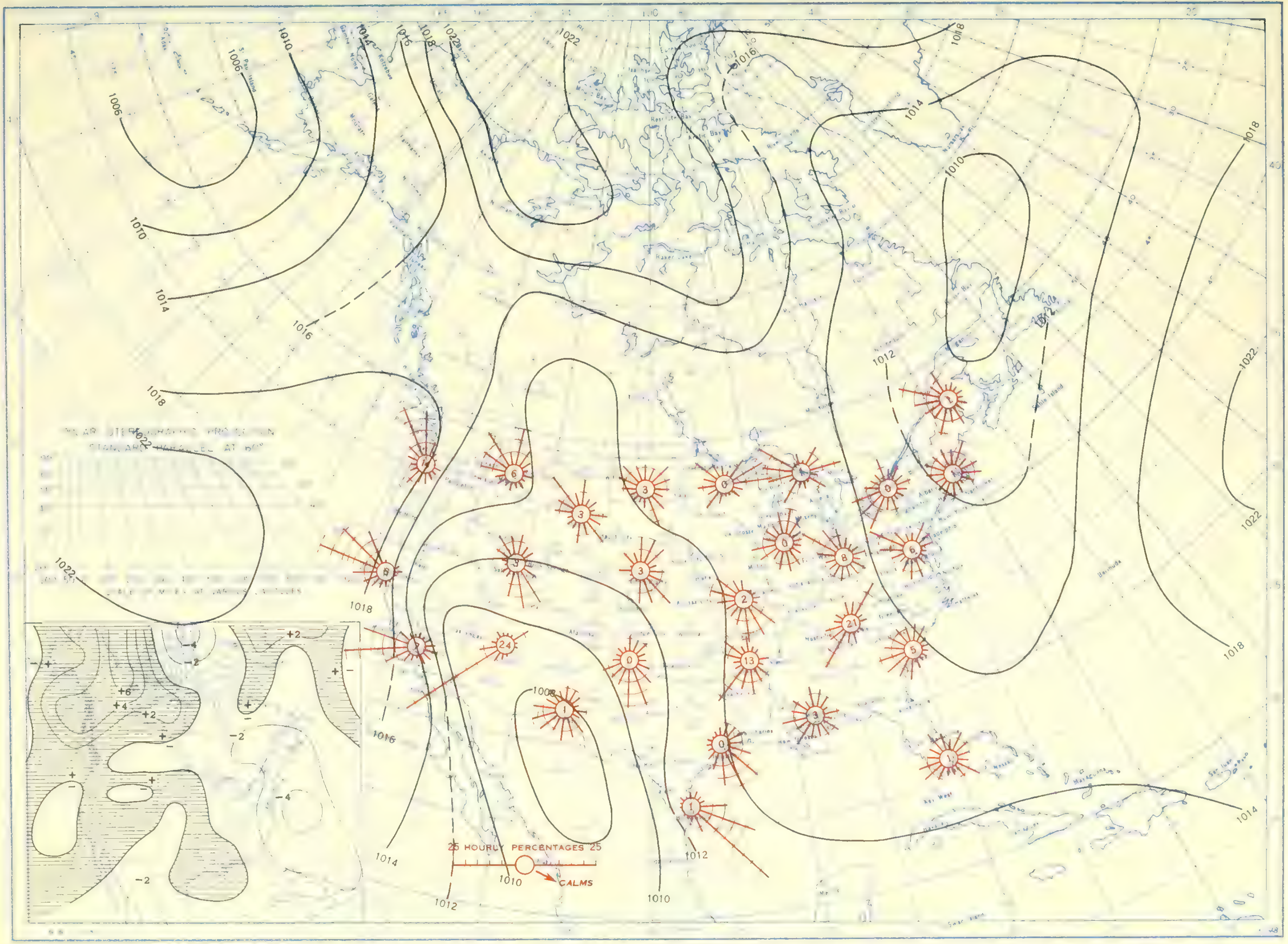
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, May, 1951.



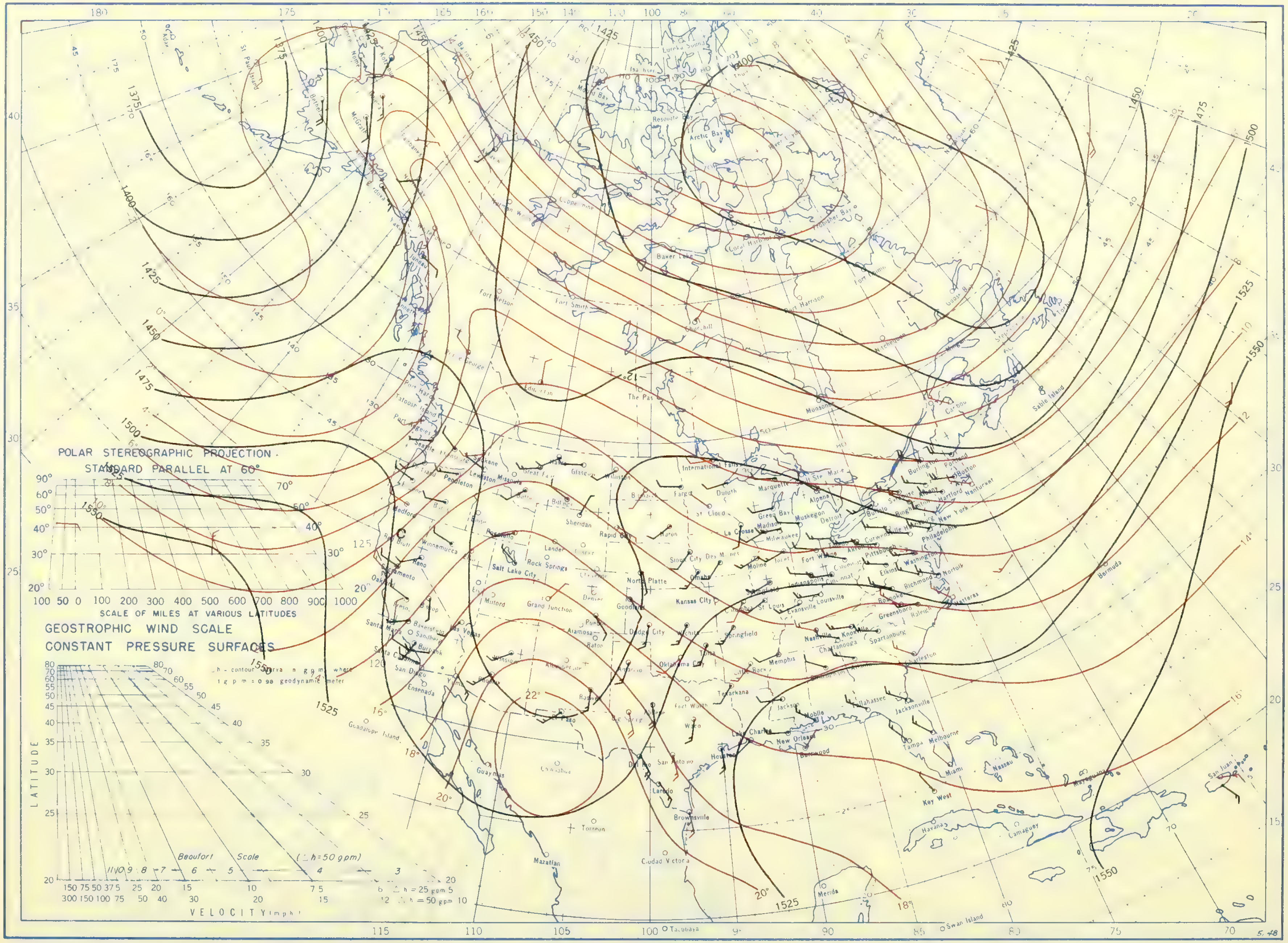
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, May 1951. Inset: Departure of Average Pressure (mb.) from Normal, May 1951.



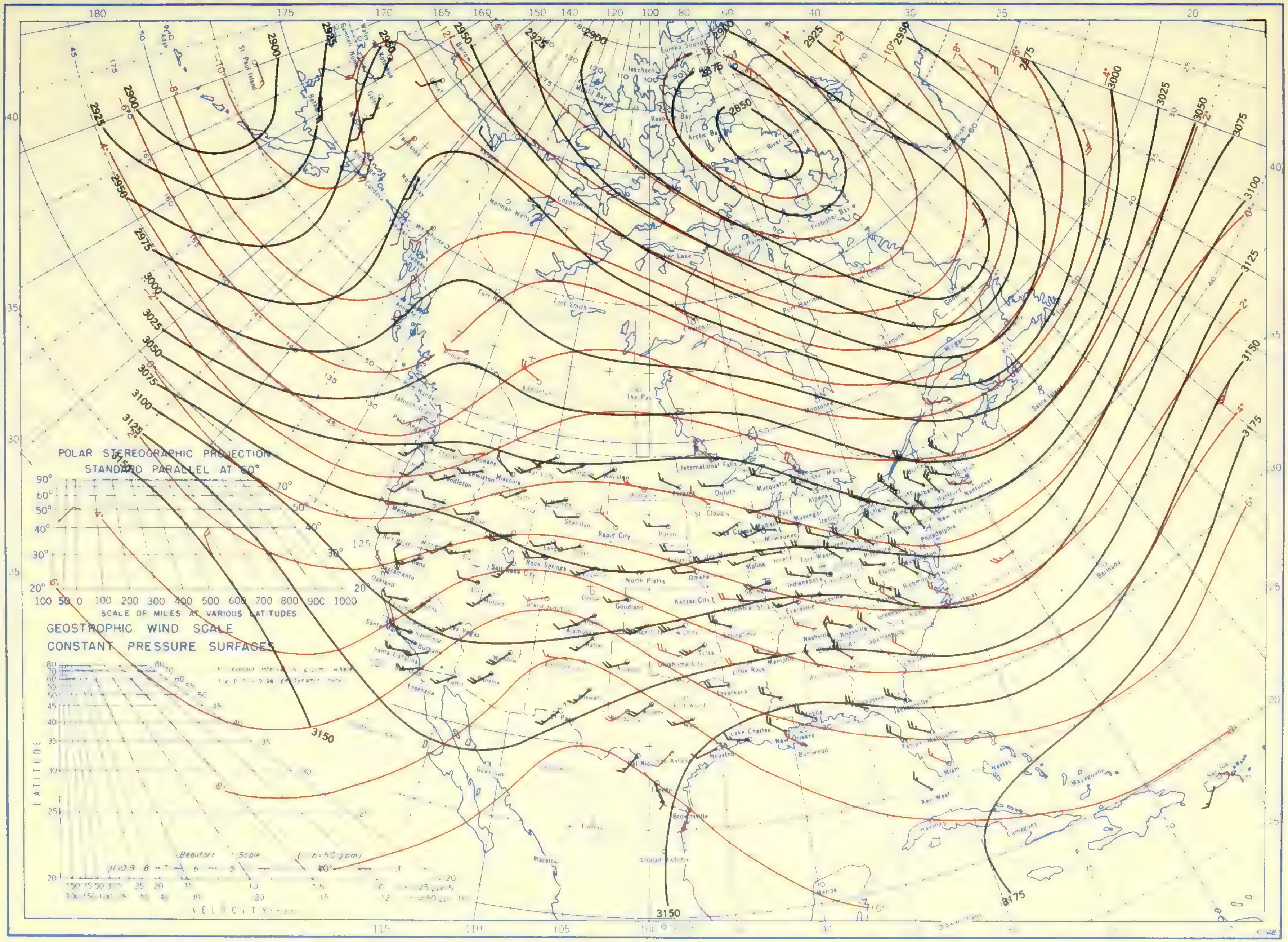
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899 1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), May 1951.



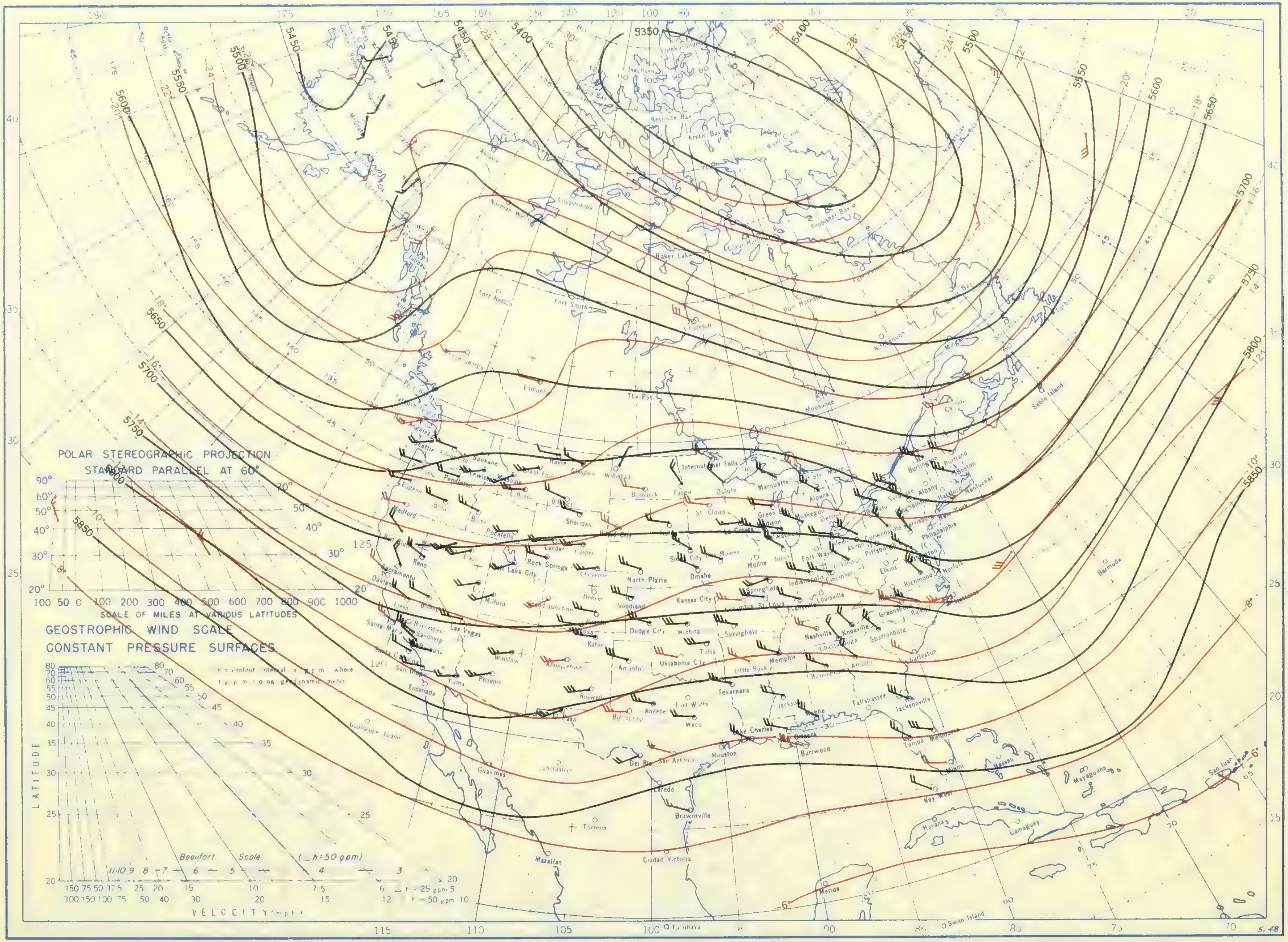
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), May 1951.



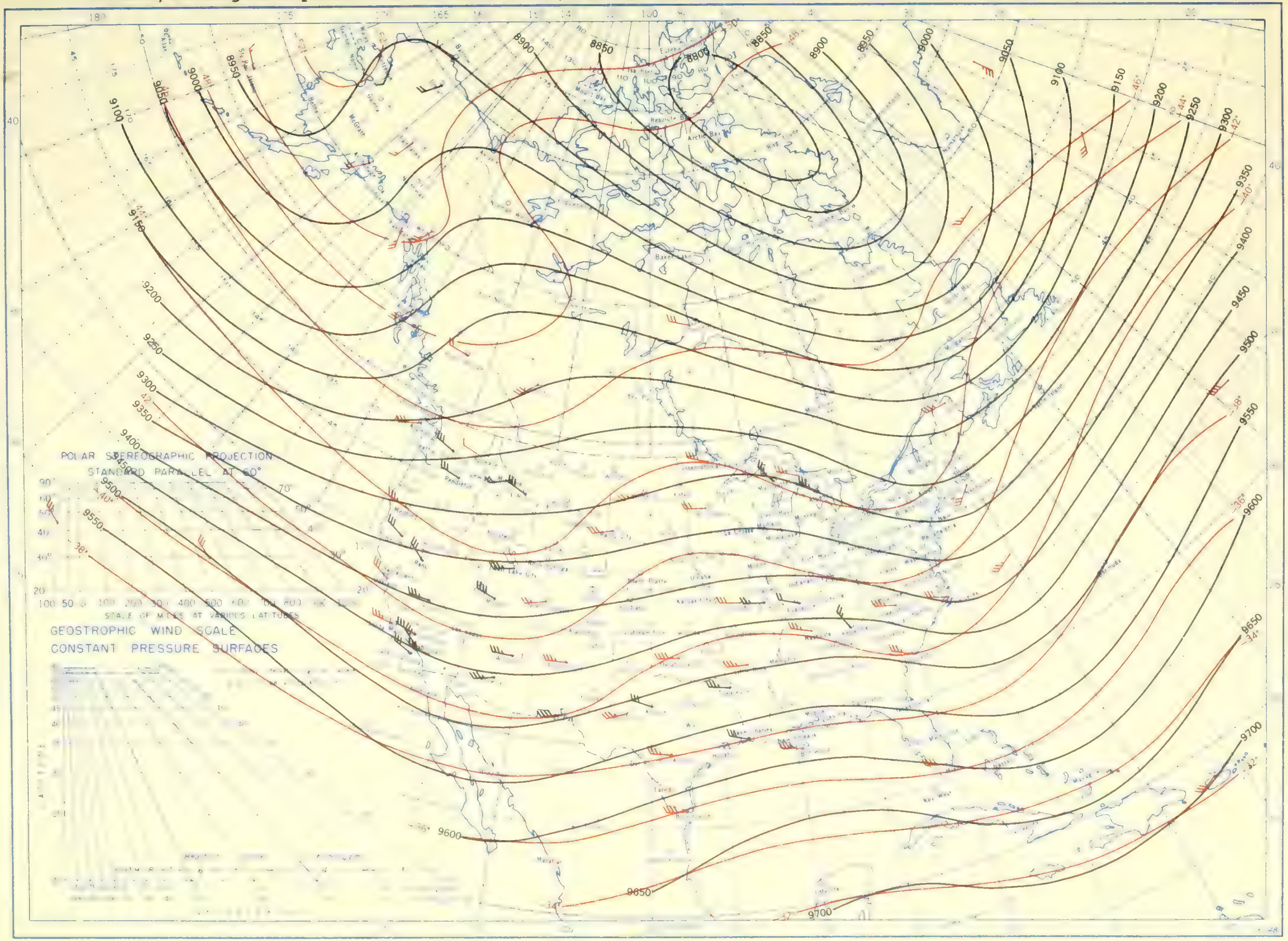
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), May 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300 mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), May 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

JUNE 1951
Volume 2 No. 6

NEW ORLEANS: 1951

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions ---------- 149

Condensed Climatological Data - States ---------- 151

Climatological Data - Stations ---------- 152

Heating Degree Days ---------- 157

Monthly and Seasonal Heating Degree Days, 1950-1951 ---------- 158

Severe Storms ---------- 162

General Summary of River and Flood Conditions ---------- 186

Flood Stage Data ---------- 189

UPPER AIR DATA

Radiosonde Data ---------- 192

Pilot Balloon Data ---------- 195

Rawin Data ---------- 196

SOLAR RADIATION DATA

Solar Radiation Intensities ---------- 197

Blue Hill Data ---------- 198

Daily Totals and Average Daily Totals by Weeks ---------- 199

CHARTS I-XV

NOTE.—This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 6

JUNE 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

The Nation-wide temperature average was 67.6° which is 1.7° below the long-term mean and the lowest average since 1947. Monthly extremes ranged from 121° at Cow Creek, Calif. on the 28th to 12° at Foxpark and Pole Mountain, Wyo. on the 2d. Highest temperatures generally occurred during the last decade in the lower Great Plains and in most sections of the western States and about the middle of the month in the northern Rockies and northern Great Plains, and during the first 2 or 3 days in most sections east of the Great Plains. Lowest temperatures generally were recorded from the Great Plains westward during the first 3 days, in the Lake Region and Mississippi Valley on the 4th or 5th, and in the eastern States during the period June 5-11. Monthly extreme maximum temperatures approached record levels along the central Atlantic Coast and in extreme southern Texas, but elsewhere generally ranged from 5° to 20° below previous June records. Texas recorded a high temperature of 116° which was within 1° of the State record for June and the highest temperature recorded this month east of the Rocky Mountains. North Carolina's highest temperature of 106° was also within 1° of the State record for June and was the highest temperature recorded during the month east of the Mississippi River. Nebraska recorded an all-time June low temperature of 23° at Harrison on the 3d, Kansas and Arizona reported minima only 1° above previous June records, and several scattered stations in the western half of the nation established new June minima. In the eastern half of the country extreme minima generally ranged from a few degrees to as much as 20° higher than previous records.

Temperatures averaged slightly below normal along the central and north Pacific Coast and in much of the Northeast, including eastern Pennsylvania and New York and most of New England except coastal areas. In north-central interior regions from the Great Lakes to the western slopes of the Rockies and as far south as Kansas, monthly averages exceeded the normals by more than 2° and ranged up to more than 8° in central Montana. Monthly averages were above normal in the Pacific States, except along the coast, and in western Nevada and western Arizona, with departures from normal ranging up to 4° in northern areas. Averages were also above normal in the East and in the South as far west as central New Mexico with departures from normal generally less than 2°.

In the north-central interior frequent cold air intrusions kept temperatures below normal most of the month, and monthly averages at a number of stations were the lowest of record for June. With a statewide average temperature of 54.4° Montana experienced its coolest June on record, and averages for Wyoming, Colorado, South Dakota, and Nebraska were within 1° or less of these States' records. One of the lowest station averages for the month was 41.3° at Kings Hill, Mont.

In the Pacific States and also Nevada and western Idaho the warmest periods of the month occurred about the middle and during the closing days. In the lower part of the Rocky Mountain Region there were brief warm periods until the last week when temperatures remained unusually high. In the central and northern Rocky Mountain Region temperatures were above normal only a few days near the middle of the month. Above-normal temperatures prevailed east of the Great Plains from the 1st to the 4th, except in extreme north-central areas, and also during the last decade.

The Nation-wide average total precipitation was 3.44 inches which is 0.53 inch above the long-term mean and the highest since 1947. Deficiencies in the western States were more than offset by the much above-normal monthly totals in the Great Plains and northeastern quarter.

West of the Plains States, state averages of precipitation were above normal only for Colorado and Wyoming, and even in these two States station totals west of the Continental Divide were generally below normal. Southeastern and north-central Montana, the Columbia River Valley of Oregon, the central Sierra Nevada Mountain Region of California, and extreme western Nevada were other western areas where precipitation was above normal. Most of the month's precipitation in northern areas west of the Divide fell during the first 2 weeks. Stations in the Pacific States and southern Rocky Mountain States that received no precipitation during the month totaled more than 700. It was the driest June on record in western Washington and Oregon, and one of the driest in Arizona and western New Mexico. Only 4 stations in Arizona received measurable amounts, and for the fourth time on record the State average was only a trace. Due to the lack of rain the forest fire hazard was high in several areas, especially in northern California and western Oregon, and one fire in Oregon burned about 3,000 acres.

East of the Rocky Mountain States numerous sections along the Northern Border and the Atlantic and Gulf Coasts also received below-normal monthly precipitation. Departures were generally slight, however, except in a few extreme southern sections, particularly a portion of central Florida and the western portion of the Gulf Coast where monthly totals were less than one-half of normal.

In other areas from the Great Plains eastward monthly totals were above normal. In the central Great Plains rains were of record to near-record frequency, monthly totals were the greatest in the country and set new records at many stations. The month's greatest total of 18.72 inches was recorded near Scott, Kan. In the northeastern quarter of the country several scattered stations received record June totals, and Pittsburgh, Pa. recorded its greatest total for any month. Intense thundershowers were numerous and widespread and often resulted in damaging flash floods. Rainfall during these heavy showers, based on official and unofficial measurements and estimates, ranged up to as much as 12 inches.

In parts of Kansas, Oklahoma, Missouri, and Illinois heavy rains caused severe flooding that resulted in much damage. Many streams were still rising at the end of the month and thousands of acres of crop land were under water.

An unusually heavy snowstorm occurred in the northern Rocky Mountain Region during the first 3 days of the month. Thirty inches of snow fell at Middle Fork, Wyo. on the 1st and 18 inches at Silver Lake, Mont. on June 1-2. A depth of 15 inches was measured at Unionville, Mont. on the 1st. In Fremont County, Wyo. the heavy snow caused about $35,000 damage to overhead wires. Due principally to this storm the average monthly snowfall for Wyoming set a new June record of 3.3 inches. The storm also extended into the western portion of the northern Great Plains, 2 to 6 inches falling in western North Dakota, up to 4 inches in the Black Hills Region of South Dakota, and up to 6.5 inches in northwestern Nebraska.

This June was also featured by a great number of severe local storms that caused over $70,000,000 damage. A great part of this damage occurred in the central Great Plains. In Kansas alone there were 42 tornadoes, 34 damaging hailstorms, 20 severe windstorms, and 34 lightning strikes, with total damage in excess of $26,000,000 of which $23,000,000 was due to hail. Ninety-five tornadoes caused over $16,000,000 damage for the country as a whole. The month's worst tornado swept through Crystal Lake and Duncan, Iowa on the 25th causing one death, eight injuries, and $6,000,000 damage. Several hailstorms caused over $1,000,000 damage each, one of the worst causing $3,000,000 damage at Scotts Bluff County, Nebr. on the 25th. The most damaging storm of the month, however, was a combination of wind and hail that swept through east-central and southeastern Kansas on the morning of the 23d causing damage estimated at more than $14,000,000. Reports of hailstones as large as baseballs came from points in Colorado, Oklahoma, Iowa, Minnesota, Kansas, and Texas. Hailstones up to 5 inches in diameter were reported to have fallen in Wichita Falls and Lubbock, Tex. In some of these hailstorms wildlife and poultry were killed and even cattle were severely injured. There were no human fatalities due to hail but a man's arm was broken near Rolla, Kan. Wind gusts reached 100 m.p.h. at Fort Sill, Okla. on the 18th, 57 m.p.h. at Nashville, Tenn. on the 22d, 98 m.p.h. at Ypsilanti, Mich. on the 1st, 68 m.p.h. at Detroit on the 1st, and 120 m.p.h. at Abilene, Tex. on the 10th. During the storm at Ypsilanti on the 1st, the wind averaged 60 m.p.h. for 5 minutes.

The month's weather was generally favorable for crops. Winter wheat harvest was delayed by frequent rains and soft ground in the lower Great Plains during much of the month, but the weather became warm and sunny in southern Oklahoma and Texas during the last week allowing rapid progress. In Kansas very little wheat harvest was accomplished during the month, and a large acreage in the eastern half was ruined by floods. In the Southwest many sections were very dry and pastures and water supplies were short.

In some sections of the Corn Belt rains delayed planting and prevented cultivation, and a considerable acreage could not be planted due to floods. The condition of the crop was generally good, however, especially in southern areas where the crop was laid by with much in tassel. Progress and condition of cotton were fairly good to mostly good at the end of the month, although much of the crop was late.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 JUNE 1951

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F.			°F		In	In.		In.		In.
Alabama	78.9	+0.7	2 Stations	100	°1	Valley Head	50	11	4.84	+0.57	Chatom	10.52	Troy	1.12
Arizona	72.3	-2.1	Pierce Ferry	115	29	Maverick	16	3	T	-.35	Flying H Ranch	.43	194 Stations	.00
Arkansas	75.9	-1.2	Blytheville	103	1	2 Stations	49	°4	6.93	+2.82	Rogers	14.27	Marvell	2.12
California	69.8	-.1	Cow Creek	121	°28	Boca	17	7	.11	-.20	Termo	1.58	333 Stations	.00
Colorado	58.2	-3.3	3 Stations	98	°17	5 Stations	18	°3	1.75	+.30	Arapahoe	7.11	7 Stations	.00
Connecticut	65.3	-.8	Waterbury	92	1	Putnam	35	■	3.25	-.28	Bakersville	5.12	Baltic	1.48
Delaware	71.1	-.4	Georgetown	95	4	Georgetown	45	12	4.45	+.64	Bridgeville	6.07	Clayton	2.85
Florida	80.4	+.5	Federal Point	100	14	Jasper 10E	51	3	4.68	-2.02	Cross City CAA AP	12.95	Tavernier	.59
Georgia	79.0	+.4	2 Stations	104	°3	La Fayette	50	11	4.44	-.02	Neel Gap	11.23	Fitzgerald	.54
Idaho	57.1	-3.2	Grand View	97	15	Sun Valley	17	3	.92	-.41	Burke 2NNE	2.78	Buhl	T
Illinois	69.7	-2.4	Palestine	99	1	Chicago Heights	36	5	6.17	+2.15	Shawneetown New Town	13.48	Lockport Power Plant	1.86
Indiana	70.0	-1.2	Evansville	101	2	La Porte	38	5	4.63	+.67	Jasper	7.79	Shelby	.83
Iowa	65.2	-4.3	Creston 2SW	93	18	Oakland 2E	33	4	6.11	+1.57	Allison	12.69	Dubuque WB AP	2.02
Kansas	68.8	-5.0	Meade	100	27	Goodland WB AP	31	2	9.55	+5.58	Scott City 14N	18.72	Richfield 4N	2.51
Kentucky	73.4	-.5	Russellville	101	1	Mammoth Cave Park	44	15	5.03	+.80	Paducah SCS Nursery	11.86	Falmouth	1.30
Louisiana	80.7	+.7	2 Stations	104	1	7 Stations	59	1	4.07	-.52	Franklinton	9.93	Hackberry	.34
Maine	60.5	-1.1	do	91	20	5 Stations	30	°8	2.32	-1.14	Fort Fairfield	4.39	Winslow	1.24
Maryland	71.0	+.2	Cumberland Pol.Brks.	102	2	Oakland	38	16	7.59	+3.56	Germantown	11.81	Easton Pol. Brks.	3.32
Massachusetts	64.2	-1.0	2 Stations	92	°1	West Cummington	29	8	2.99	-.53	Chesterfield	5.93	North Truro	.43
Michigan	62.1	-1.8	Sandusky	95	13	Garnet	26	5	3.73	+.32	Champion Van Riper Pk.	8.54	Glen Arbor	.85
Minnesota	61.0	-3.4	Albert Lea	89	17	2 Stations	29	4	4.78	+.69	Winnebago	10.71	Thief Lake Refuge	1.21
Mississippi	79.3	+.4	2 Stations	103	1	Charleston	54	6	5.39	+1.18	Picayune	10.27	Belmont	1.46
Missouri	71.0	-2.3	Malden AP CAA	102	1	5 Stations	42	°4	8.95	+4.15	Windsor 3NW	16.04	Clarksville L & D 24	3.01
Montana	54.4	-5.7	2 Stations	94	15	Summit	15	1	2.35	-.40	Babb 6NE	9.32	Grant	.34
Nebraska	63.2	-6.1	Broken Bow 1	95	25	Harrison	23	3	5.79	+2.02	Lincoln College View	14.13	Gordon 27SE	1.50
Nevada	64.6	-.6	North Las Vegas Dox.	114	28	Fish Creek Ranch	16	3	.16	-.36	Virginia City	1.30	26 Stations	.00
New Hampshire	61.6	-1.4	Windham	91	1	3 Stations	30	°6	2.87	-.77	East Deering	5.08	Milan 6N	1.62
New Jersey	68.7	-.4	Pleasantville	95	27	Charlotteburg	36	12	3.80	-.01	Phillipsburg	7.98	Sandy Hook	1.73
New Mexico	69.2	-.5	3 Stations	110	°20	Gavilan	16	10	.36	-.82	Cunico Ranch	3.10	73 Stations	.00
New York	64.1	-1.0	Dansville	94	18	3 Stations	29	8	4.23	+.58	West Kill	8.33	Lewiston	1.61
North Carolina	74.8	+.6	Mount Gilead	105	3	Mount Mitchell	37	°5	5.54	+.88	Coweeta No. 8	13.78	Morehead City	1.51
North Dakota	58.6	-4.5	4 Stations	93	°15	Hankinson RR Sta.	28	1	2.89	-.62	Max	5.91	Williston WB City	.87
Ohio	69.7	.0	Gallipolis 5W	99	2	2 Stations	38	6	4.59	+.61	Xenia 2N	8.48	Chilo Dam 34	1.19
Oklahoma	75.3	-2.3	Frederick	105	22	Boise City	37	2	7.11	+3.09	Atoka	14.20	Hollis	1.68
Oregon	60.7	+.9	Oakridge RS	105	29	Seneca	18	2	.51	-.92	Tollgate	5.45	44 Stations	.00
Pennsylvania	67.6	-.5	Artemas	99	2	2 Stations	34	°7	5.85	+1.69	Greensburg 2E	13.74	Phila. Point Breeze	2.34
Rhode Island	64.3	-.4	Providence WB City	92	1	Kingston	39	8	2.14	-.84	Austin	2.95	Providence WB City	1.52
South Carolina	77.8	.0	Little Mountain	106	3	2 Stations	52	°6	4.66	-.01	Long Creek	8.92	Marion 3W	1.89
South Dakota	59.7	-6.4	Wagner	92	25	do	14	3	4.61	+1.01	Iroquois	9.70	Willett	1.43
Tennessee	74.7	-.1	2 Stations	100	°1	Gatlinburg 2SW	46	11	6.27	+1.98	Buchanan	12.55	Pickwick Landing Dam	2.96
Texas	80.0	+.6	Presidio	116	20	Dalhart CAA AP	41	2	3.18	+.34	Honey Grove	12.92	8 Stations	.00
Utah	62.3	-2.2	St George CAA	107	28	Bryce Canyon CAA	19	3	.38	-.32	Moon Lake	1.56	11 Stations	.00
Vermont	62.1	-1.0	2 Stations	89	°2	Dorset 1S	29	■	3.11	-.60	Searsburg Station	6.30	Gilman	1.52
Virginia	71.9	.0	Buggs Island Dam	105	3	Burkes Garden	40	7	6.27	+2.09	Mons	11.11	Davenport	1.71
Washington	61.2	+.4	Longview	100	30	Bumping Lake	25	1	1.08	-.53	Mill Creek	5.26	Olympia Priest Pt.Pk.	T
West Virginia	69.8	.0	3 Stations	98	°2	Cranberry Glades	29	16	6.55	+2.04	Rowlesburg	11.97	Kayford	2.48
Wisconsin	61.8	-3.0	do	89	°1	Long Lake Dam	28	5	4.72	+.53	Ridgeland	9.78	Kewaunee	1.31
Wyoming	53.3	-5.2	do	90	°15	2 Stations	12	2	1.89	+.15	Redbird	4.93	Rairden	.10
Alaska (April)	27.3	+4.0	do	62	°17	do	-25	°1	1.41	+.28	Little Port Walter	23.84	Hughes	T
Hawaii (May)	72.5	+.6	Matsonia Drive	93	28	Haleakala RS	38	°12	2.65	-3.34	Kukui	26.60	10 Stations	.00
Puerto Rico	78.5	+.8	Utuado (2)	96	11	Guineo Reservoir	58	°1	5.33	-.63	Coloso	16.36	Yauco	1.30

° Other dates also.

CLIMATOLOGICAL DATA

Table 2

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days				Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy			
												Max. 90° F. or above	Min. 32° F. or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date						
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
ALABAMA																																	
Birmingham	610	991.9	1015.6	89	67	78.1	+1.3	95	1	61	11	14	0	66	73	7.31	+2.85	2.07	9	12	T	0	6.3	SSW	42	SW	7	3	18	9	6.8	55	0
Mobile CO	10	------	------	89	73	81.3	+1.1	95	23	67	11	15	0	--	--	8.18	+2.75	2.39	10	11	.0	0	---	---	50	NW	10	6	12	12	6.4	58	0
Mobile	211	1007.8	1015.5	90	70	80.0	----	95	10	65	3	17	0	71	79	10.09	-----	3.24	10	12	.0	0	9.0	S	--	--	--	7	12	11	6.4	--	0
Montgomery CO	201	------	------	--	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	---	---	--	--	--	-	--	--	---	--	0
Montgomery	198	1008.1	1015.2	92	70	80.9	+1.3	97	23	64	3	23	0	68	69	3.31	-.49	2.40	10	10	.0	0	5.9	SW	42	E	1	7	16	7	5.3	76	0
ARIZONA																																	
Flagstaff	6993	787.3	1014.0	76	37	56.7	----	89	28	22	2	0	6	25	31	T	-----	T	0	0	.0	0	6.9	SW	--	--	--	21	7	2	2.5	--	248
Payson CO	5000	846.9	1010.8	88	50	69.1	----	99	28	41	4	14	0	33	28	.00	-----	.00	0	0	.0	0	4.9	NE	--	--	--	24	3	3	1.6	--	33
Phoenix CO	1083	------	------	100	68	84.0	-.5	109	28	58	3	29	0	--	--	T	-.07	T	0	0	.0	0	6.8	--	23	W	1	--	--	--	---	97	0
Phoenix	1108	969.2	1007.0	100	66	83.0	----	109	27	55	3	30	0	39	23	T	-.07	T	0	0	.0	0	5.4	E	--	--	--	24	2	4	1.5	--	0
Prescott	5014	845.6	1010.0	86	51	68.1	----	97	28	36	2	9	0	26	22	.00	-----	.00	0	0	.0	0	10.3	SW	27	SW	20	24	4	2	1.6	95	47
Tucson	2558	921.8	1007.7	98	63	80.5	-2.1	106	27	54	2	27	0	27	16	T	-.27	T	0	0	.0	0	6.0	SSE	21	NW	27	26	3	1	1.1	98	0
Winslow	4880	849.3	1007.5	89	52	70.6	-.8	101	28	37	2	16	0	19	16	.00	-.30	.00	0	0	.0	0	9.5	SW	*40	WSW	1	24	3	3	1.8	--	23
Yuma	203	1002.0	1006.9	103	69	85.9	----	111	27	60	7	30	0	40	23	.00	-----	.00	0	0	.0	0	7.8	SSE	27	S	°4	26	2	2	1.0	99	0
ARKANSAS																																	
Fort Smith	458	996.3	1012.6	86	67	76.2	-1.3	98	1	60	4	13	0	67	77	3.79	+5.07	2.93	17	17	T	0	7.0	NE	58	N	8	6	9	15	6.3	48	0
Little Rock	257	1000.7	1013.5	87	68	77.6	+.2	96	1	60	6	11	0	69	80	4.89	+1.13	1.45	17	14	.0	0	5.9	SSW	36	NW	29	8	8	14	6.2	65	0
Texarkana	361	1000.3	1013.2	88	69	78.6	-1.0	94	1	62	12	17	0	70	80	5.95	+2.10	1.92	11	11	.0	0	7.8	SSE	--	--	--	6	11	13	5.9	--	0
CALIFORNIA																																	
Bakersfield	489	992.6	1010.2	94	63	78.4	+.7	103	16	52	7	24	0	45	33	.00	-.07	.00	0	0	.0	0	6.8	WNW	--	---	--	28	2	0	.8	--	0
Beaumont CO	2589	922.8	1012.1	84	49	66.5	----	102	28	41	4	5	0	44	34	.01	-----	.01	1	0	.0	0	8.0	W	*22	E	2	21	7	2	2.1	--	35
Bishop	4108	870.6	1008.5	93	52	72.0	----	104	30	37	2	20	0	--	--	.33	-----	.21	4	6	.0	0	----	---	--	---	--	15	11	4	3.7	--	14
Blue Canyon	5280	838.8	1011.0	73	53	63.3	----	83	14	39	7	0	0	39	42	.00	-----	.00	0	1	.0	0	8.9	NE	--	---	--	27	0	3	1.7	--	103
Burbank	699	986.5	1012.8	77	57	67.0	----	88	2	52	26	0	0	53	69	T	-----	T	0	0	.0	0	6.2	S	*17	S	°1	13	13	4	4.4	--	8
Eureka CO	43	1014.2	1016.6	57	49	53.1	-1.2	65	14	43	1	0	0	--	--	T	-.72	T	0	0	.0	0	7.0	---	28	SW	19	6	8	16	7.1	34	348
Fresno	331	999.0	1010.4	91	57	74.2	-1.5	99	16	47	7	18	0	51	47	.06	-.02	.06	1	1	.0	0	8.2	WNW	24	NW	1	25	3	2	1.6	98	2
Los Angeles CO	312	------	------	75	58	66.7	+.3	89	2	55	9	0	0	--	--	T	-.08	T	0	0	.0	0	5.3	---	17	W	5	8	15	7	5.3	58	7
Los Angeles	99	1009.5	1013.2	70	59	64.5	----	82	2	55	1	0	0	55	73	T	-----	T	0	0	.0	0	5.4	WSW	--	---	--	3	21	6	5.6	--	22
Mt. Shasta CO	3543	891.3	1013.5	81	48	64.3	+3.7	93	15	37	6	5	0	43	48	T	-.89	T	0	0	.0	0	7.8	NW	--	---	--	24	4	2	1.9	--	85
Oakland	3	1013.7	1014.1	68	54	60.7	+.3	90	2	49	1	1	0	50	75	.01	-.19	.01	1	0	.0	0	8.5	WNW	--	---	--	7	18	5	4.8	--	132
Red Bluff	341	998.0	1010.6	94	63	78.5	+3.7	106	18	52	6	21	0	46	36	.10	-.37	.10	1	1	.0	0	7.0	SSE	29	NW	1	24	4	2	1.6	99	0
Sacramento CO	25	------	------	--	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	----	--	--	--	--	---	--	9
Sacramento	17	1010.2	1011.1	86	53	69.2	-.2	98	13	47	7	7	0	50	58	T	-.15	T	0	0	.0	0	13.0	SW	33	SW	4	28	0	2	1.0	96	9
Sandberg CO	4517	861.2	1010.7	77	54	65.3	----	87	27	42	5	0	0	36	38	.00	-----	.00	0	0	.0	0	16.6	NW	--	---	--	27	3	0	.9	--	75
San Diego	19	1009.8	1013.1	71	61	65.7	+.7	82	2	56	2	0	0	55	71	T	-.05	T	0	0	.0	0	6.8	W	18	NW	2	9	15	6	5.1	56	4
San Francisco CO	52	------	------	61	51	56.3	-2.2	79	2	48	10	0	0	--	--	.04	-.14	.03	3	0	.0	0	11.8	---	36	W	5	6	8	16	6.5	57	257
San Francisco	1	1013.5	1014.1	67	51	58.9	+1.0	83	13	45	4	0	0	49	75	.01	-.12	.01	1	0	.0	0	12.4	W	35	W	6	13	10	7	4.7	--	177
Santa Catalina	1568	957.0	1012.7	66	52	59.1	----	81	2	49	6	0	0	--	--	.09	-----	.05	4	0	.0	0	----	---	--	---	--	12	6	12	5.7	--	182
Santa Maria	231	1005.8	1014.4	68	51	59.4	----	76	1	42	2	0	0	51	78	.02	-----	.02	1	0	.0	0	6.4	W	*21	WNW	6	9	15	6	4.9	--	163
COLORADO																																	
Alamosa	7534	771.4	1013.0	78	37	57.3	----	91	29	26	4	1	6	--	--	.03	-----	.02	2	2	.0	0	----	---	--	---	--	18	12	0	3.0	--	228
Colorado Springs	6175	811.0	1013.6	72	47	59.0	----	90	25	32	3	1	1	42	62	1.38	-----	.28	17	16	.1	T	11.7	SSE	--	---	--	5	13	12	6.1	--	198
Denver	5292	836.4	1012.6	73	48	60.9	-4.4	91	25	30	2	1	1	42	59	2.27	+.68	.91	15	13	.8	T	7.5	S	34	W	17	4	15	11	6.3	52	164
Grand Junction	4849	856.4	1009.2	83	53	68.0	-3.4	96	29	41	2	8	0	31	31	.28	-.12	.17	3	5	.0	0	9.2	ESE	66	S	1	11	15	4	4.6	77	49
Pueblo	4799	855.4	1011.2	80	51	65.3	-3.3	98	25	38	3	7	0	45	55	1.01	-.35	.24	14	12	T	T	6.9	NE	38	NW	6	10	13	7	5.3	49	81
CONNECTICUT																																	
Bridgeport	7	1014.6	1015.4	75	59	66.9	----	88	1	48	12	0	0	59	78	2.34	-----	.85	7	3	.0	0	8.4	SW	*29	ESE	14	7	6	17	6.9	--	40
Hartford	15	1009.1	1015.0	77	57	66.7	-.4	90	1	46	8	1	0	58	75	3.49	+.41	.91	10	4	.0	0	7.5	S	25	NW	25	2	8	20	8.1	45	54
New Haven	6	1010.8	1014.9	74	58	65.6	+2.3	85	25	47	12	0	0	--	--	2.36	-.44	.80	11	3	.0	0	7.2	---	27	SE	14	5	5	20	7.2	51	53
DELAWARE																																	
Wilmington	73	1011.5	1014.7	80	61	70.4	----	91	1	50	12	2	0	62	77	4.27	-----	1.26	12	8	.0	0	7.6	SSE	--	---	--	8	9	13	6.5	--	19
FLORIDA																																	
Apalachicola CO	13	1014.6	------	86	73	79.7	-.1	90	24	65	18	2	0	--	--	4.83	-.77	2.36	8	9	.0	0	----	---	34	NW	18	13	8	9	4.7	80	0
Daytona Beach	33	1014.6	1016.2	89	68	78.8	+.5	96	9	57	3	14	0	71	83	2.66	-3.01	.79	12	16	.0	0	7.5	SSW	*35	WSW	17	12	10	8	5.1	--	0
Fort Meyers	15	1015.9	1016.3	93	69	81.0	+1.0	97	14	63	3	30	0	70	74	9.19	+.28	4.65	7	9	.0	0	7.1	E	--	---	--	9	19	2	4.7	--	0
Jacksonville CO	18	------	------	--	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	0
Jacksonville	52	1014.9	1016.1	92	71	81.6	+1.1	97	5	62	2	22	0	69	72	3.86	-1.47	1.31	14	15	.0	0	5.6	SW	33	W	17	7	12	11	6.1	58	0
Key West CO	5	1015.2	1015.9	91	77	83.7	+1.8	93	13	72	4	22	0	--	--	1.62	-2.62	.66	6	7	.0	0	----	---	29	NE	26	16	11	3	3.8	83	0
Key West	6	1015.6	1016.0	90	77	83.4	+2.3	94	14	69	25	19	0	72	70	3.09	-1.15	1.65	5	7	.0	0	8.4	E	--	---	--	13	16	1	4.1	--	0
Lakeland	214	------	------	90	71	80.5	+.5	95	24	66	2	20	0	--	--	4.76	-3.20	2.17	11	14	.0	0	----	---	--	---	--	7	15	8	5.6	--	0
Melbourne	22	1015.2	1016.5	89	70	79.8	+.7	94	30	64	3	18	0	71	79	2.62	-2.78	1.28	8	14	.0	0	7.5	SW	*22	NNE	10	9	15	6	5.1	--	0
Miami CO	180	------	------	86	74	79.6	-.4	89	23	66	18	0	0	--	--	5.19	-1.98	1.01	13	12	.0	0	----	---	40	SW	18	6	20	4	5.3	69	0
Miami	9	1015.2	1016.2	90	72	81.0	----	94	11	65	3	20	0	71	73	5.08	-----	2.33	12	11	.0	0	6.9	SE	*45	SSW	18	9	14	7	5.0	--	0
Miami Beach CO	3	------	------	86	76	81.2	----	90	18	68	19	1	0	--	--	6.02	-----	2.99	11	--	.0	0	----	---	--	---	--	24	5	1	---	--	0
Orlando	111	1012.2	1016.4	91	70	80.5	+.1	96	27	60	2	20	0	69	76	5.08	-2.07	2.30	13	15	.0	0	9.0	SW	*35	WSW	18	10	12	8	5.2	--	0
Pensacola	13	1013.5	1015.4	88	74	80.7	+1.4	95	10	68	10	7	0	72	--	7.71	+3.03	3.05	11	12	.0	0	6.0	SW	29	W	10	10	6	14	5.9	77	0
Tallahassee	64	1013.5	1016.0	91	70	80.7	----	95	24	64	2	20	0	69	74	4.60	-----	.92	13	15	.0	0	4.9	NW	--	---	--	5	13	12	6.3	--	0
Tampa	24	1015.2	1016.5	92	73	82.6	+2.4	98	24	63	2	27	0	70	71	1.86	-5.39	1.01	6	10	.0	0	7.3	W	35	NW	18	13	11	6	4.6	70	0
West Palm Beach	14	1015.6	1016.2	91	72	81.7	----	96	10	68	4	26	0	72	77	6.34	-1.65	1.48	9	11	.0	0	7.1	SE	--	---	--	10	15	5	5.0	--	0
GEORGIA																																	
Albany	190	1008.8	1015.6	94	71	82.2	+1.1	101	23	64	2	27	0	68	64	5.09	+.47	1.76	10	12	.0	0	3.8	W	--	---	--	9	11	10	5.5	--	0
Atlanta CO	1054	------	------	--	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	---	---	--	---	--	--	--	--	---	--	0
Atlanta	977	974.6	1015.1	88	67	77.5	+.8	96	24	61	11	12	0	69	64	4.86	+.92	.94	12	12	.0	0	7.3	NW	40	S	28	9	11	10	5.6	79	0
Athens	798	986.1	------	88	66	76.8	----	99	3	56	11	11	0	--	--	7.87	-----	1.54	14	14	.0	0	---	---	--	---	--	11	10	9	5.1	--	0
Augusta	426	1008.5	1014.7	92	67	79.6	+.9	103	3	61	11	19	0	68	73	3.38	-1.70	1.10	12	14	.0	0	5.9	SW	*27	WSW	9	7	15	8	5.6	--	0
Columbus	382	1001.4	1015.3	92	68	79.6	----	100	23	60	12	22	0	66	68	5.43	-----	1.63	11	10	.0	0	6.3	W	--	---	--	8	12	10	5.7	--	0
Macon	354	1001.7	1014.8	94	69	81.3	----	100	23	65	11	24	0	66	65	5.64	-----	3.44	7	12	.0	0	8.3	WNW	32	S	30	7	12	11	5.7	81	0
Rome	637	992.2	1015.3	90	63	76.5	----	97	1	54	11	15	0	67	76	4.60	-----	1.51	14	9	.0	0	6.0	SW	--	---	--	9	12	9	5.7	--	0
Savannah	38	1012.9	1015.1	91	69	80.2	+2.0	97	27	62	7	21	0	69	73	3.04	-2.25	1.00	9	17	.0	0	6.9	SW	29	NE	24	6	16	8	5.9	60	0
Valdosta	200	1007.5	1014.0	93	69	81.3	+1.0	100	23	59	2	25	0	68	--	4.48	-1.02	1.08	13	15	.0	0	7.6	SW	--	---	--	4	16	10	6.2	--	0
IDAHO																																	
Boise	2842	917.4	1012.3	77	48	62.3	-2.2	89	15	37	1	0	0	39	46	.70	-.22	.45	4	0	.0	0	7.2	WNW	30	W	4	19	7	4	3.2	87	106
Lewiston	1413	963.8	1014.7	78	49	63.1	----	92	30	34	1	1	0	44	55	2.36	----	1.01	7	0	.0	0	3.9	NE	--	---	--	16	4	10	4.6	--	103
Pocatello	4444	861.5	1012.9	75	45	59.9	-1.6	88	15	33	2	0	0	33	40	.31	-.78	.15	3	3	.0	0	8.5	S	35	SW	18	15	12	3	3.6	85	174
ILLINOIS																																	
Cairo CO	314	1000.7	1013.2	85	68	76.1	-1.2	97	1	59	5	7	0	--	--	10.24	+6.41	3.02	17	15	.0	0	6.6	---	43	NW	8	3	9	18	7.9	63	3
Chicago	618	990.9	1013.2	77	57	66.9	-1.2	92	1	43	5	2	0	55	69	2.05	-1.43	.90	9	6	.0	0	7.1	ENE	30	N	1	2	7	21	7.8	56	44
Joliet	580	992.2	1013.1	78	54	66.3	-1.5	91	1	39	5	2	0	58	77	3.56	-.30	1.70	11	7	.0	0	8.1	S	--	---	--	2	10	18	7.6	--	49
Moline	589	991.9	1014.0	76	58	67.2	-2.1	90	1	43	5	1	0	58	75	6.65	+2.54	1.92	15	11	T	0	7.7	E	34	W	27	1	8	21	8.2	43	37
Peoria	659	991.5	1013.4	77	60	68.4	-2.0	89	1	43	5	0	0	59	76	4.04	+2.27	1.00	12	8	.0	0	8.3	E	36	W	23	3	7	20	7.8	49	24
Springfield CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	----	----	--	--	--	-	---	---	--	---	--	--	--	--	---	--	9
Springfield	598	991.2	1013.1	78	60	69.3	-.3	93	1	45	5	2	0	61	79	8.80	+4.74	11.73	15	12	T	0	9.5	NW	15	N	27	3	8	19	7.8	54	15

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	998.3	1013.7	83	65	74.0	+2.1	97	2	52	5	6	0	65	78	4.76	+0.72	0.96	21	12	0.0	0	7.6	SSW	31	NW	25	4	7	19	7.4	60	5
Fort Wayne	801	983.1	1013.7	78	58	68.2	+.8	91	2	45	6	2	0	59	76	5.11	+1.54	1.66	14	9	.0	0	7.0	NW	57	S	27	3	7	20	7.5	67	26
Indianapolis CO	----	------	------	--	--	----	----	--	--	--	-	-	-	--	--	-----	-----	----	--	--	---	-	----	---	--	--	--	--	--	--	---	--	11
Indianapolis	796	984.8	1013.9	80	60	69.9	.0	94	2	48	5	3	0	60	76	5.77	+2.15	2.02	12	11	.0	0	8.9	NW	42	W	27	5	7	18	7.4	65	13
South Bend	768	985.4	1013.3	77	55	66.1	-2.6	92	1	44	5	1	0	57	75	4.07	+.74	2.86	9	6	.0	0	9.4	NW	*40	NW	1	3	6	21	8.0	--	53
Terre Haute	585	993.2	1013.8	81	60	70.5	-1.5	93	1	42	5	3	0	62	77	4.17	+.24	1.30	18	12	T	0	6.7	N	57	SW	28	4	8	18	7.3	51	15
IOWA																																	
Burlington	605	988.2	1013.4	76	59	67.5	-4.0	90	1	46	5	1	0	59	77	4.63	-.07	1.25	13	13	.0	0	7.6	ESE	33	NW	26	2	6	22	8.3	39	34
Charles City CO	1013	977.0	1013.5	73	55	63.9	-2.6	83	17	40	5	0	0	--	--	3.43	-1.20	1.52	11	5	T	T	5.1	---	22	SE	25	4	10	16	7.1	42	71
Davenport CO	579	991.9	------	77	60	68.4	-2.1	90	1	47	5	1	0	--	--	6.59	+2.48	2.05	11	9	.0	0	----	---	--	--	--	--	--	--	---	--	35
Des Moines	800	983.4	1013.6	75	58	66.4	-3.2	87	1	43	4	0	0	58	79	3.86	-.90	1.30	13	10	.0	0	9.1	SE	52	NW	26	2	9	19	7.8	43	54
Dubuque	641	974.6	1013.4	73	54	63.7	----	83	1	42	5	0	0	57	80	2.02	-----	.58	15	11	.0	0	8.6	NW	*27	WSW	24	1	7	22	8.2	--	79
Sioux City	1097	972.2	1013.0	75	55	65.3	-3.5	88	17	44	3	0	0	56	76	4.00	+.01	1.05	11	9	T	T	7.3	ESE	47	E	19	4	10	16	7.2	61	68
KANSAS																																	
Concordia CO	1375	963.4	1012.5	77	59	67.8	-5.2	90	19	43	4	1	0	--	--	11.84	+7.43	4.22	17	18	.0	0	6.8	---	31	S	1	4	12	14	6.9	45	44
Dodge City	2594	924.8	1011.2	78	57	67.2	-5.3	92	27	42	2	2	0	57	73	7.95	+4.65	1.83	17	24	.3	T	12.8	NE	59	NW	8	6	13	11	5.9	61	50
Goodland	3645	887.6	1012.5	74	50	62.1	-7.9	91	25	31	2	2	1	53	78	7.14	+4.37	2.20	17	19	2.0	2	11.0	SE	*66	NNW	10	10	10	10	5.6	--	134
Topeka CO	----	------	------	--	--	----	----	--	--	--	--	-	-	--	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	19
Topeka	926	981.0	1012.7	79	59	69.1	----	91	19	46	4	3	0	62	82	10.59	-----	2.07	17	18	T	T	8.7	ESE	38	NW	8	0	14	16	7.8	42	20
Wichita	1372	964.1	1011.7	81	61	71.0	-3.4	93	27	45	4	3	0	61	75	10.07	+5.69	2.43	17	18	T	T	12.1	S	47	S	1	5	12	13	6.5	56	19
KENTUCKY																																	
Lexington	979	979.3	1014.4	83	63	73.4	+1.2	96	2	53	6	6	0	63	73	4.38	+.33	.97	14	11	.0	0	8.0	SSW	--	---	--	8	12	10	6.2	--	0
Louisville CO	----	------	------	--	--	----	----	--	--	--	--	-	-	--	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	0
Louisville	485	997.6	1013.7	84	64	74.3	+.8	97	2	53	11	9	0	64	75	4.45	+.63	1.37	13	12	T	T	7.0	SE	46	SE	2	5	9	16	6.9	61	0
LOUISIANA																																	
Baton Rouge	64	1012.5	1014.7	91	71	81.2	-1.1	97	26	67	11	21	0	70	77	2.32	-2.45	.78	8	8	.0	0	5.8	SW	--	---	--	7	18	5	5.3	--	0
Lake Charles	12	1012.9	1014.1	92	72	81.9	+2.2	96	26	66	5	25	0	72	80	1.61	-2.86	.92	8	5	.0	0	9.3	S	--	---	--	5	19	6	5.7	--	0
New Orleans CO	12	1012.9	------	91	75	82.7	+2.1	94	22	70	3	20	0	--	--	4.96	-.92	1.80	12	12	.0	0	5.6	---	19	N	19	7	15	8	5.4	57	0
New Orleans	12	1013.9	1015.0	91	72	81.4	----	95	22	67	3	21	0	72	80	2.98	-----	.93	9	13	.0	0	6.9	S	*36	SW	1	11	11	8	4.9	--	0
Shreveport	174	1004.4	1013.4	91	71	81.3	+.8	96	9	63	12	21	0	70	77	2.81	-.69	1.06	11	9	.0	0	9.7	SSW	46	N	10	8	12	10	5.5	65	0
MAINE																																	
Caribou	624	991.9	1015.1	68	47	57.8	-.1	86	20	32	9	0	2	49	72	3.94	+.02	1.48	10	4	.0	0	9.1	S	*50	WNW	6	1	10	19	7.7	--	233
Eastport	33	1012.5	1015.2	63	49	56.0	+.9	76	24	41	6	0	0	--	--	2.12	-.85	.57	11	0	.0	0	7.4	---	25	E	11	5	10	15	6.9	59	265
Portland	61	1010.8	1015.0	70	50	59.9	+.3	85	20	38	8	0	0	53	78	2.97	-.31	1.06	13	1	.0	0	7.9	SSW	28	N	25	5	7	18	7.2	56	171
MARYLAND																																	
Baltimore CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	10
Baltimore	146	1010.5	1015.0	82	62	72.0	----	95	2	53	11	8	0	62	74	8.80	-----	2.33	13	11	.0	0	9.6	S	42	W	27	3	16	11	6.5	42	17
Frederick	294	------	------	83	60	71.7	----	96	4	50	°6	7	0	--	--	11.26	-----	2.56	15	8	T	T	----	---	--	---	--	--	--	--	---	--	7
MASSACHUSETTS																																	
Boston	12	1010.2	1014.9	74	58	66.0	-.5	91	1	51	15	1	0	54	71	4.31	+1.42	1.75	10	2	.0	0	11.6	SW	*31	NE	11	2	7	21	7.5	57	63
Nantucket	43	1014.2	1014.7	68	54	60.7	-.3	84	25	46	5	0	0	74	86	.96	-1.71	.36	7	2	.0	0	9.9	SW	*32	E	10	2	12	16	7.3	53	140
Pittsfield	1153	972.6	1014.6	73	51	61.7	-1.4	83	1	36	8	0	0	--	--	3.26	-.57	1.24	9	5	.0	0	6.8	---	--	---	--	4	9	17	7.1	--	128
MICHIGAN																																	
Alpena CO	587	991.5	1013.9	69	52	60.7	+.3	80	20	39	5	0	0	--	--	3.09	-.21	1.66	11	4	.0	0	9.2	---	29	W	20	9	7	14	6.0	66	136
Detroit	619	987.1	1013.5	78	58	67.8	+1.6	89	1	46	5	0	0	57	70	3.13	-.43	1.02	11	5	.0	0	7.8	S	56	SW	1	4	11	15	6.7	62	32
Escanaba CO	594	991.2	1013.2	67	52	59.3	-1.4	75	29	38	5	0	0	--	--	3.47	+.25	.70	13	5	.0	0	9.4	---	36	N	24	9	10	11	5.7	65	167
Grand Rapids Co	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	33
Grand Rapids	638	988.8	1013.6	75	55	65.0	-.4	89	18	40	6	0	0	55	74	5.45	+1.97	1.94	14	9	.0	0	6.4	W	34	W	20	4	11	15	7.0	57	58
Lansing	859	982.1	1013.8	76	55	65.8	-1.0	87	18	43	6	0	0	56	74	3.26	-.25	1.00	9	6	.0	0	8.1	WSW	35	NE	22	6	10	14	6.7	59	50
Marquette CO	677	986.5	1013.5	65	49	56.7	-2.2	83	16	40	3	0	0	--	--	7.35	+4.13	1.89	13	8	T	T	5.9	---	26	NW	20	5	9	16	6.8	61	259
Muskegon	627	990.5	1013.4	73	53	62.8	-.9	85	18	38	6	0	0	54	73	2.19	-.62	.80	9	3	.0	0	6.8	WNW	*29	NW	1	6	13	11	6.4	--	89
Sault Ste. Marie	721	991.2	1013.9	69	45	57.0	-.5	82	17	32	5	0	1	49	75	4.05	+1.34	1.52	11	6	T	T	7.6	WNW	30	W	20	7	10	13	6.3	52	238
Ypsilanti	722	985.4	1013.4	79	57	68.1	----	90	1	45	5	1	0	55	69	3.34	-----	1.03	9	6	.0	0	8.9	W	*60	W	1	4	10	16	7.1	--	28
MINNESOTA																																	
Duluth CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	263
Duluth	1128	962.1	1013.5	68	48	57.6	----	82	15	34	4	0	0	49	78	5.04	-----	2.97	15	3	.0	0	10.5	E	45	E	2	2	19	9	6.5	60	228
Intern'l Falls	1179	970.2	1013.3	71	47	58.9	-3.2	85	15	32	4	0	1	49	72	3.84	+.28	1.45	15	6	T	0	----	---	--	---	--	3	8	19	7.4	--	189
Minneapolis	830	980.4	1013.4	74	55	64.7	-2.8	87	14	42	4	0	0	53	70	5.50	+1.28	1.56	14	6	T	T	9.8	SE	35	E	1	8	10	12	6.1	54	78
Rochester	1014	976.6	1013.5	74	53	63.3	-4.0	84	17	40	5	0	0	54	73	5.50	+1.03	1.68	11	5	.0	0	7.8	SE	--	---	--	0	11	19	7.8	--	85
St. Cloud	1034	975.3	1013.1	73	51	61.6	-4.0	84	14	33	4	0	0	53	75	7.85	+3.64	1.77	15	5	T	0	6.6	WNW	--	---	--	7	9	14	6.5	--	131
St. Paul	703	986.8	1012.9	74	56	64.6	-2.5	85	14	42	4	0	0	53	68	5.25	+1.11	1.60	13	8	T	T	8.2	SE	*30	SE	19	5	13	12	6.4	--	74
MISSISSIPPI																																	
Jackson	315	1003.4	1014.8	92	70	81.0	+1.4	102	1	64	11	21	0	69	71	2.63	-1.50	.87	13	12	.0	0	7.1	SSW	40	NW	10	6	16	8	5.8	58	0
Meridian	294	1001.7	1014.9	92	68	80.0	+2.8	98	1	61	4	24	0	69	75	4.60	+.05	1.78	7	9	.0	0	5.3	SW	--	---	--	10	14	6	5.2	--	0
Vicksburg	234	1006.8	------	89	70	79.5	+.5	94	1	64	6	16	0	--	--	4.99	+1.00	1.49	12	11	T	0	7.4	---	37	SW	10	5	15	10	6.0	61	0
MISSOURI																																	
Columbia	733	984.8	1012.9	80	61	70.1	-2.6	90	1	49	5	2	0	62	79	7.38	+2.62	1.81	22	19	T	T	10.5	SSE	58	NW	19	1	9	20	7.9	55	14
Kansas City	741	978.3	1012.7	79	61	69.7	-3.9	93	1	50	4	3	0	61	77	8.42	+3.74	1.17	19	16	T	0	6.6	SSW	60	SW	23	1	11	18	7.9	48	20
St. Joseph	809	978.0	1012.5	78	60	68.8	-4.9	91	1	50	4	1	0	60	79	13.73	+8.78	4.03	17	14	.0	0	7.9	N	47	N	19	2	11	17	7.6	42	21
St. Louis CO	465	992.9	------	81	64	72.6	-2.4	94	1	53	5	4	0	--	--	6.23	+2.41	1.75	17	11	.0	0	8.6	---	46	SW	26	3	8	19	7.6	65	7
St. Louis	465	992.9	1012.9	82	63	72.2	-1.8	94	2	52	5	4	0	62	74	6.16	+1.87	1.23	19	14	.0	0	6.3	S	--	---	--	2	10	18	7.6	--	7
Springfield	1265	966.1	1013.0	80	62	70.7	-1.0	93	1	51	3	1	0	64	84	8.86	+4.18	2.77	15	17	.0	0	10.8	SSE	57	S	21	1	9	20	7.7	45	15
MONTANA																																	
Billings	3568	891.3	1014.5	69	45	56.9	-8.0	87	15	32	3	0	3	40	58	1.70	-----	.44	13	9	T	T	9.6	SW	42	W	°5	4	17	9	6.0	68	246
Butte	5530	830.3	1017.5	62	35	48.6	-7.1	82	15	24	3	0	12	33	60	.88	-1.41	.32	6	5	1.3	T	8.7	NW	--	---	--	6	6	18	7.0	--	486
Glasgow CO	2090	940.1	1013.9	73	46	59.8	-4.2	90	15	30	1	1	1	44	61	2.22	-.73	.64	14	5	.0	0	----	---	--	---	--	5	15	10	6.1	--	177
Great Falls	3664	888.9	1015.8	65	43	54.1	-8.3	83	15	32	7	0	1	39	64	3.57	+.44	.70	16	7	T	T	11.5	SW	52	W	18	4	11	15	7.0	58	326
Havre CO	2488	926.2	1014.6	69	45	57.0	-5.0	86	14	35	1	0	0	--	--	4.11	+1.25	1.39	14	5	T	T	8.3	---	40	NW	15	4	11	15	6.8	66	251
Helena	3893	874.4	1016.2	67	41	53.9	-5.3	85	15	31	3	0	1	39	62	1.61	-.43	.67	10	1	.9	T	7.9	W	34	W	18	4	11	15	6.8	69	336
Kalispell	2965	912.0	1014.9	67	42	54.5	----	79	14	28	1	0	2	42	65	1.81	-----	.58	14	8	T	0	8.3	S	--	---	--	4	10	16	6.7	--	308
Miles City	2629	930.2	1014.1	71	47	59.4	----	90	15	32	1	1	2	45	--	3.05	-----	1.36	13	11	T	0	9.5	WNW	--	---	--	11	11	8	5.4	--	183
Missoula	3201	902.1	1016.0	69	43	55.9	-3.7	82	15	31	1	0	2	39	57	1.15	-.85	.39	8	3	.0	0	6.7	N	42	NE	19	7	7	16	6.5	54	270
NEBRASKA																																	
Grand Island	1841	947.2	1012.5	74	54	64.1	----	90	25	38	4	1	0	55	75	2.28	-----	.48	16	15	.0	0	11.2	NW	--	---	--	7	9	14	6.4	--	86
Lincoln CO	1184	970.5	------	76	58	66.7	-4.7	89	19	43	4	0	0	--	--	11.94	+7.62	4.65	17	13	T	T	7.2	---	38	NW	25	--	--	--	---	41	53
Lincoln	1180	970.5	1013.0	75	56	65.9	-4.7	89	25	42	4	0	0	58	--	9.76	+5.44	3.60	17	10	T	0	7.8	SE	--	---	--	5	9	16	7.0	--	62
Norfolk	1554	958.0	1013.1	74	54	64.1	-5.7	89	25	41	3	0	0	55	76	2.47	-2.26	.73	15	11	T	T	9.2	SE	--	---	--	5	11	14	6.7	--	86
North Platte	2783	914.7	1012.6	72	51	61.8	-5.7	88	16	36	2	0	0	52	75	10.47	+7.25	2.55	17	19	T	T	9.8	SE	47	NW	16	6	14	10	6.4	48	124
Omaha	978	973.6	1013.2	76	58	66.8	-3.9	89	25	42	4	0	0	58	78	4.88	+.32	1.74	15	13	.0	0	8.3	SE	52	W	25	2	10	18	7.6	44	57
Scottsbluff	3950	878.4	1013.1	72	48	59.9	-6.7	86	16	32	2	0	1	47	72	4.82	+2.19	1.37	19	22	1.1	0	8.8	SE	--	---	--	6	13	11	6.4	--	163
Valentine CO	2581	923.5	1014.6	70	50	59.9	-7.0	84	25	35	2	0	0	--	--	4.47	+1.60	.94	18	16	T	0	8.6	---	38	NW	19	3	14	13	6.7	65	172

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days		Average dew point					No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
NEVADA																																	
Elko	5075	843.2	1013.0	79	38	58.4	----	92	16	24	3	2	8	33	40	0.01	-----	0.01	1	1	0.0	0	7.0	NW	--	---	--	20	4	6	3.3	--	206
Ely	6257	808.3	1012.5	76	38	56.8	+1.0	90	28	22	3	1	7	--	--	.36	-.26	.17	6	7	T	0	9.7	--	42	N	20	12	11	7	5.3	62	241
Las Vegas	2162	932.3	1006.0	98	66	82.0	+1.0	112	28	54	4	26	0	22	13	.00	-.14	.00	0	0	.0	0	7.3	SW	--	---	--	24	5	1	1.7	91	0
Reno	4397	860.1	1012.1	83	44	63.3	+2.2	95	30	32	2	8	2	39	44	.67	+.38	.62	2	4	.0	0	4.8	WNW	26	W	°6	23	4	3	2.4	89	104
Winnemucca	4299	866.6	1012.1	82	43	62.3	-.5	93	15	29	3	4	5	30	30	T	-.72	T	0	0	.0	0	8.2	---	35	W	4	18	7	5	3.2	96	136
NEW HAMPSHIRE																																	
Concord	339	1004.1	1014.0	74	52	62.9	+1.2	89	1	35	8	0	0	53	72	3.29	+.10	1.26	10	1	.0	0	4.9	NW	26	NE	10	3	6	21	7.8	43	108
Mt. Washington	6262	808.0	1020.0	49	38	43.2	-2.2	62	20	26	7	0	7	--	90	3.30	-2.96	.61	18	0	.6	T	22.2	W	**81	WNW	25	1	5	24	8.7	21	648
NEW JERSEY																																	
Atlantic City	8	1012.5	1014.2	73	63	68.2	+1.6	91	25	51	12	1	0	--	--	4.90	+1.86	1.98	14	5	.0	0	----	---	57	NE	10	6	13	11	6.2	66	29
Newark	11	1013.5	1014.9	78	61	69.6	-.3	91	24	47	12	3	0	59	71	2.65	-1.24	.62	14	3	.0	0	8.5	SW	30	E	10	6	8	16	6.8	--	27
Trenton CO	56	1008.1	1014.9	79	61	70.0	+.5	91	1	51	12	1	0	--	--	2.55	-.54	.59	12	5	.0	0	----	---	25	N	3	2	12	16	7.3	59	29
NEW MEXICO																																	
Albuquerque	5310	845.9	1006.3	90	60	74.7	+2.1	101	29	48	2	17	0	22	18	.02	-.47	.02	1	2	.0	0	9.4	S	45	E	3	25	4	1	1.9	91	5
Clayton	4969	845.9	1010.2	80	52	66.0	-3.8	95	26	38	3	4	0	52	66	1.82	-.03	1.10	5	14	T	T	14.8	NE	--	---	--	13	9	8	4.4	--	71
Raton	6379	804.6	1009.9	78	47	62.5	----	96	29	33	2	4	0	40	51	1.79	-----	1.13	9	12	1.0	T	9.9	S	--	---	--	10	14	6	4.8	--	137
Roswell	3611	887.9	1007.4	94	61	77.7	+1.4	107	29	51	9	21	0	42	36	.39	-1.28	.38	2	4	T	T	11.0	SSE	40	SW	20	18	8	4	3.2	80	11
NEW YORK																																	
Albany	277	1009.1	1014.2	77	55	66.0	-.7	88	1	38	8	0	0	54	70	4.19	+1.12	1.22	13	6	T	0	7.2	SSE	29	NW	25	2	12	16	7.5	48	60
Bear Mountain	1300	------	------	72	56	64.1	----	85	19	46	15	0	0	--	--	3.87	-----	1.31	11	2	.0	0	----	---	--	---	--	9	4	17	6.7	--	89
Binghamton	1601	956.3	1015.1	73	54	63.1	----	84	3	42	8	0	0	55	76	4.26	-----	1.05	14	6	.0	0	10.5	SE	40	NW	30	1	12	17	7.7	52	104
Buffalo	693	986.8	1014.6	76	56	66.3	+1.4	86	17	44	6	0	0	55	71	4.48	+1.66	1.29	12	8	.0	0	11.3	SW	45	WNW	2	4	13	13	6.8	57	42
New York CO	10	1003.1	------	76	61	68.7	-.1	87	1	52	15	0	0	--	--	2.70	-.63	.66	11	4	.0	0	11.0	---	40	NW	25	7	6	17	6.6	63	29
New York	19	1013.2	1014.9	78	62	69.9	----	90	1	53	11	1	0	58	70	2.64	-----	.88	11	2	.0	0	10.6	NE	35	NW	25	7	5	18	6.8	--	21
Oswego	292	1001.7	1013.9	73	56	64.2	+1.3	85	19	46	8	0	0	--	--	3.81	+.56	.87	14	7	.0	0	7.5	---	24	N	6	6	12	12	6.5	57	78
Rochester	543	989.2	1014.1	76	56	66.2	+.1	90	24	43	6	1	0	56	72	4.43	+1.43	1.77	12	7	.0	0	8.0	SW	29	SW	24	6	13	11	6.6	55	53
Syracuse	399	992.6	1014.3	76	55	65.5	+1.0	88	18	42	8	0	0	56	72	4.21	+.34	1.28	13	6	.0	0	8.7	SE	27	NW	30	5	12	13	7.0	52	65
NORTH CAROLINA																																	
Asheville CO	2203	------	------	83	60	71.1	+2.4	95	3	50	11	6	0	--	--	7.03	+3.10	1.10	17	13	.0	0	----	---	37	NW	26	4	15	11	6.3	64	2
Charlotte	741	988.2	1015.0	88	65	76.4	+2.0	99	3	57	9	13	0	65	72	5.12	+.90	2.01	11	10	.0	0	6.4	SW	28	NW	8	8	8	14	6.4	73	0
Greensboro	891	983.7	1015.2	87	63	74.9	+.9	100	2	54	1	12	0	64	75	7.96	+3.10	3.23	14	10	.0	0	8.0	SW	42	NW	27	9	8	13	5.8	63	1
Hatteras	4	1014.2	1014.9	80	70	74.8	-.8	85	25	58	12	0	0	69	82	2.85	-1.67	.91	9	10	.0	0	11.1	SSW	32	NW	10	8	12	10	5.7	74	1
Raleigh CO	400	------	------	89	66	77.1	+1.4	101	24	58	1	14	0	--	--	3.40	-.99	1.23	12	6	.0	0	----	---	18	SW	8	5	15	10	6.1	57	0
Raleigh	438	999.3	1014.9	89	64	76.2	----	99	2	52	1	14	0	64	73	3.43	-----	.95	12	10	.0	0	6.9	SW	--	---	--	8	15	7	5.4	--	0
Wilmington CO	6	1013.5	------	86	70	77.8	+1.0	93	25	64	7	7	0	--	--	3.48	-1.62	.83	9	9	.0	0	----	---	45	W	9	4	14	12	6.4	53	0
Winston-Salem CO	967	980.4	------	87	64	75.4	+1.4	101	2	58	11	12	0	--	--	3.49	-.86	.79	13	9	.0	0	----	---	--	---	--	9	13	8	5.3	--	2
NORTH DAKOTA																																	
Bismarck	1653	953.9	1013.5	71	47	59.0	-3.9	88	15	37	3	0	0	49	72	2.29	-1.06	.95	14	8	.0	0	10.1	SSE	45	N	16	6	10	14	6.3	61	189
Devils Lake CO	1471	960.0	1013.2	69	48	58.5	-3.4	85	15	35	1	0	0	--	--	2.70	-.86	.90	12	2	.0	0	8.0	---	30	S	25	6	13	11	6.1	55	204
Fargo	895	978.7	1012.7	72	49	60.7	-3.7	85	14	39	4	0	0	49	69	2.36	-1.69	1.05	9	5	T	T	11.4	SSE	39	NE	2	8	12	10	6.0	64	147
Williston CO	1877	945.8	1013.0	71	48	59.4	-3.3	90	15	31	1	1	1	43	62	.87	-2.56	.20	11	3	.0	0	7.8	---	34	SE	6	5	9	16	7.1	62	185
OHIO																																	
Akron	1210	970.2	1014.4	78	56	67.1	-1.4	89	2	43	6	0	0	59	76	5.35	+1.59	1.18	13	8	T	T	7.2	S	--	---	--	2	14	14	7.0	--	43
Cincinnati OBS	761	------	------	83	63	72.7	+1.5	94	2	50	6	3	0	--	--	3.15	-.51	.84	14	11	.0	0	5.1	---	34	NW	27	--	--	--	---	49	3
Cincinnati	871	982.4	1013.8	82	62	72.3	----	93	2	50	6	3	0	62	73	1.86	-----	.45	15	9	.0	0	8.8	SSW	--	---	--	6	7	17	6.8	--	2
Cleveland CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	28
Cleveland	787	986.5	1013.8	80	58	69.1	+1.4	91	2	44	6	2	0	58	71	3.25	+.13	1.26	13	9	.0	0	9.0	S	41	W	28	4	12	14	6.7	51	26
Columbus CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	7
Columbus	815	984.4	1013.9	81	60	70.8	+1.7	95	2	44	6	3	0	61	73	4.43	+1.12	.88	15	8	.0	0	6.0	SE	29	E	13	6	9	15	6.8	51	13
Dayton	1002	978.0	1013.9	80	61	70.4	-.5	92	2	49	6	1	0	60	73	4.67	+.88	2.00	15	9	.0	0	9.1	SE	56	W	27	4	9	17	7.3	57	10
Sandusky	603	991.5	------	78	62	70.1	+1.3	92	1	50	7	2	0	--	--	3.59	+.10	1.32	13	8	.0	0	6.6	---	25	SW	28	6	11	13	6.4	70	15
Toledo	621	990.9	1013.8	78	59	68.4	+1.2	90	1	48	6	1	0	59	74	5.09	+1.76	2.38	12	8	.0	0	8.7	ESE	38	NW	1	5	10	15	7.0	42	25
Youngstown	1178	972.2	1014.1	80	56	68.1	+1.1	88	24	44	6	0	0	58	75	2.93	-.45	.75	13	8	.0	0	7.6	SE	*30	NW	3	3	15	12	6.7	0	44
OKLAHOMA																																	
Oklahoma City CO	1254	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	---	---	--	---	--	--	--	--	---	--	8
Oklahoma City	1254	965.8	1011.3	84	66	75.2	-.8	95	17	53	4	5	0	66	77	6.17	+2.50	3.04	14	15	T	0	14.7	SSE	*87	NNW	20	7	12	11	6.0	62	6
Tulsa	672	987.8	1011.6	84	66	74.7	-1.8	93	27	53	4	7	0	66	76	9.30	+4.85	3.07	15	20	.0	0	10.6	S	42	NW	22	5	10	15	6.8	61	5
OREGON																																	
Baker	3369	------	------	--	--	----	----	--	--	--	--	--	-	39	--	----	-----	----	--	--	--	-	8.1	NNW	--	---	--	--	--	--	---	--	---
Baker CO	3446	895.4	1015.5	72	43	57.3	-1.3	86	30	33	2	0	0	--	--	.58	-.76	.30	5	0	.0	0	6.9	---	24	N	1	18	4	8	3.8	74	227
Burns CO	4140	873.0	1014.1	77	44	60.4	+1.9	89	15	34	3	0	0	34	40	.02	-.93	.02	1	1	.0	0	---	---	--	---	--	20	4	6	3.3	--	152
Eugene	364	1003.4	1016.9	82	47	64.7	----	100	29	39	8	5	0	48	61	T	-----	T	0	0	.0	0	8.3	N	--	---	--	20	5	5	3.0	--	73
Meacham	4050	877.4	1017.0	66	43	54.8	----	83	30	32	1	0	1	38	58	2.80	-----	1.03	6	1	T	0	5.8	NNW	--	---	--	14	7	9	4.8	--	299
Medford	1314	967.5	1014.2	87	50	68.2	+2.4	98	29	40	5	9	0	43	45	.00	-.76	.00	0	0	.0	0	6.4	N	*28	N	4	24	4	2	1.9	--	36
Pendleton	1489	961.7	1014.8	78	53	65.8	+1.9	93	30	40	1	1	0	41	46	.76	-.22	.45	5	2	.0	0	8.5	SE	--	---	--	18	3	9	3.9	--	59
Portland CO	30	------	------	78	55	66.4	+4.0	97	29	49	19	3	0	--	--	.03	-1.49	.03	1	-	.0	0	---	---	--	---	--	--	--	--	---	--	48
Portland	21	1015.6	1016.9	77	52	64.5	+3.4	97	29	46	8	3	0	50	65	.03	-----	.01	3	0	.0	0	5.2	NNW	22	W	14	15	7	8	4.4	69	64
Roseburg CO	479	998.0	1016.3	82	52	67.0	+4.5	99	29	44	1	5	0	--	--	.00	-1.09	.00	0	0	.0	0	5.5	---	21	NE	14	19	7	4	2.9	91	39
Salem	195	1009.5	1016.8	81	47	64.0	+2.2	99	29	38	1	5	0	48	61	.01	-1.20	.01	1	0	.0	0	6.4	NW	--	---	--	19	4	7	3.5	--	85
Sexton Summit CO	3836	------	------	75	49	61.7	----	88	29	35	7	0	0	--	--	.00	-----	.00	0	0	.0	0	---	---	--	---	--	24	4	2	1.9	--	139
Troutdale	29	------	------	77	49	63.2	----	96	30	42	1	3	0	--	--	.12	-----	.08	3	0	.0	0	---	---	--	---	--	14	9	7	4.2	--	83
PENNSYLVANIA																																	
Allentown	381	1001.0	1015.2	78	58	67.8	-2.0	87	1	48	12	0	0	59	75	6.34	+2.34	2.86	11	9	.0	0	6.5	E	--	---	--	4	14	12	6.6	--	45
Curwensville	2215	------	------	73	54	63.6	----	85	3	46	6	0	0	56	80	6.12	-----	1.48	15	12	.0	0	9.3	SSW	25	NW	3	2	11	17	7.5	--	82
Erie	655	------	------	75	59	67.1	+.9	88	1	49	6	0	0	--	--	4.17	+.83	.86	18	10	.0	0	---	---	29	W	2	7	14	9	5.9	59	36
Harrisburg	335	1000.7	1014.3	80	60	70.1	-.2	90	24	51	6	2	0	59	71	4.79	+1.20	1.21	15	7	.0	0	6.9	ESE	35	W	27	3	15	12	6.8	52	28
Park Place	1932	------	1015.4	73	55	64.1	----	84	°1	43	11	0	0	--	--	5.19	-----	.81	14	6	.0	0	---	---	--	---	--	3	13	14	6.8	--	100
Philadelphia CO	26	------	------	79	63	71.3	-.1	90	1	52	11	1	0	--	--	3.06	-.18	.60	12	5	.0	0	---	---	29	E	10	2	15	13	6.9	53	21
Philadelphia	13	1013.5	1014.5	81	62	71.3	+.7	91	1	51	11	3	0	63	74	4.17	+.93	1.00	16	6	T	T	8.5	S	27	E	10	1	15	14	7.2	--	19
Pittsburgh CO	749	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	---	---	--	---	--	--	--	--	---	--	2
Pittsburgh	1248	984.1	1014.4	80	61	70.3	+1.7	92	3	52	6	2	0	59	70	10.25	+6.44	2.34	12	9	T	0	7.6	S	34	W	3	1	13	16	7.5	54	5
Reading	266	1002.4	1013.9	80	61	70.8	+.5	91	1	52	11	2	0	--	--	4.73	+1.18	.99	14	10	.0	0	---	---	52	N	3	2	11	17	7.5	53	24
Scranton CO	746	985.8	1014.6	78	57	67.4	-.4	90	3	49	11	1	0	--	--	5.64	+1.97	1.90	13	8	.0	0	---	---	35	SW	3	5	13	12	6.6	51	46
Williamsport	527	995.6	1014.5	80	56	68.0	-1.1	90	27	48	12	1	0	57	73	4.32	+.61	1.28	13	7	T	T	6.8	E	*62	WNW	3	4	12	14	6.7	--	45
RHODE ISLAND																																	
Block Island	110	1010.8	------	69	57	62.7	+.9	82	25	50	°12	0	0	--	--	2.00	-.62	.74	8	1	.0	0	---	---	--	---	--	6	9	15	6.9	--	92
Providence CO	12	------	------	75	58	66.4	-1.9	92	1	49	6	1	0	--	--	1.52	-1.16	.85	1	1	T	0	---	---	--	---	--	--	--	--	---	--	54
Providence	55	1009.1	1015.1	74	56	65.0	-1.1	88	1	46	°6	0	0	55	75	2.64	-.04	1.31	10	1	.0	0	7.9	SSW	26	NW	25	4	8	18	7.3	63	74

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1013.9	------	86	73	79.2	+0.3	92	9	67	8	8	0	--	--	4.99	+0.40	1.64	9	16	0.0	0	----	---	49	NW	9	8	11	11	5.4	64	0
Charleston	41	1013.2	1015.0	88	68	78.0	+.8	95	28	58	7	17	0	69	79	4.70	+.49	2.04	13	17	.0	0	6.9	SSW	---	---	-	7	13	10	5.7	--	0
Columbia CO	332	1002.0	------	90	69	79.3	+1.2	102	3	63	9	13	0	--	--	4.77	+.60	1.46	12	15	T	T	----	---	40	W	8	11	11	8	5.3	66	0
Columbia	217	1006.4	1014.5	92	68	80.0	----	104	3	63	1	19	0	66	70	4.79	-----	1.20	10	17	.0	0	6.3	SW	---	---	-	8	16	6	5.2	--	0
Florence	146	1009.1	1014.7	91	67	79.1	----	98	2	60	7	21	0	66	72	7.32	-----	2.78	11	12	.0	0	7.5	SW	---	---	-	8	14	8	5.7	--	0
Greenville	1006	978.0	1014.5	86	66	76.1	+2.0	100	3	59	10	12	0	64	71	4.61	+.06	1.27	14	10	.0	0	6.7	NNE	46	SW	8	5	11	14	6.4	63	0
Spartanburg	801	985.8	1015.2	87	66	76.4	+.1	99	3	60	9	12	0	65	73	5.09	+1.03	1.68	11	10	.0	0	7.1	W	*47	WSW	9	8	9	13	5.9	--	0
SOUTH DAKOTA																																	
Huron	1282	966.5	1013.2	72	51	61.4	-4.8	84	13	37	4	0	0	52	76	7.12	+3.33	2.24	11	10	T	0	9.7	S	59	NW	27	7	7	16	6.7	66	130
Rapid City	3215	901.1	1014.4	69	46	57.7	-6.5	85	15	31	2	0	2	46	69	3.75	+.71	1.40	14	14	3.6	3	10.9	NNW	42	NW	27	6	11	13	6.4	52	220
Sioux Falls	1420	962.4	1013.6	73	51	62.2	-5.8	86	16	35	4	0	0	53	76	7.94	+3.57	1.99	14	10	T	T	8.6	SSE	*30	NNW	25	5	8	17	7.3	--	124
TENNESSEE																																	
Bristol	1519	961.4	1015.5	82	60	71.3	-1.7	92	3	51	6	6	0	63	78	5.04	+1.21	1.46	17	12	T	0	6.7	NNE	---	---	--	3	14	13	6.4	--	2
Chattanooga	670	987.8	1014.8	88	65	76.9	+3.7	96	1	55	11	14	0	65	74	5.50	+1.34	1.65	13	11	.0	0	4.0	SSW	53	SW	7	5	16	9	6.2	61	0
Knoxville	949	980.4	1015.0	86	65	75.5	+1.7	98	2	56	11	13	0	65	73	5.81	+1.71	1.57	12	12	T	T	7.0	SW	58	NW	22	5	14	11	6.1	48	0
Memphis CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	---	---	--	-	--	--	---	--	0
Memphis	263	999.3	1013.9	87	68	77.3	+.9	97	1	59	6	10	0	68	77	6.88	+2.48	2.20	12	10	.0	0	8.2	SSW	50	S	7	5	13	12	6.7	64	0
Nashville	577	994.9	1014.4	86	66	76.3	+.7	98	1	57	11	10	0	66	76	7.40	+3.40	1.44	15	13	T	0	5.9	S	57	W	22	2	14	14	7.1	48	0
TEXAS																																	
Abilene	1752	949.5	1009.4	91	69	80.0	+2.4	102	22	56	2	20	0	65	66	3.03	+.04	1.42	7	11	T	T	14.6	SSE	109	NW	10	11	9	10	5.2	--	5
Amarillo	3590	888.6	1009.3	85	59	72.2	+.8	98	29	43	11	12	0	56	63	4.34	+1.50	2.07	8	11	T	T	14.8	SE	54	NE	11	11	11	8	4.3	64	29
Austin	515	990.5	1012.3	91	72	81.8	+.6	96	17	64	3	23	0	71	75	6.19	+3.75	3.82	4	3	T	T	10.9	S	36	N	12	8	16	6	5.6	63	0
Big Spring	2533	922.5	1009.1	95	68	81.7	+1.2	110	20	55	3	25	0	58	56	1.83	-.08	1.66	2	6	T	0	17.8	S	---	---	--	12	10	8	4.6	--	6
Brownsville	16	1008.5	1011.0	90	77	83.3	+.9	94	18	71	4	21	0	74	81	1.37	-1.80	1.08	5	1	.0	0	15.4	SE	33	E	4	7	18	5	5.1	70	0
Corpus Christi	40	1011.2	1012.0	91	76	83.5	+4.0	94	29	69	4	23	0	75	83	4.02	+1.43	3.89	3	5	.0	0	16.2	SSE	40	SE	13	11	14	5	4.8	81	0
Dallas	487	993.6	1011.5	91	71	80.9	+.5	97	30	60	4	22	0	69	71	6.21	+2.30	4.09	9	7	.0	0	13.5	S	37	SW	16	8	15	7	5.1	62	0
Del Rio	957	972.6	1010.4	96	74	85.0	+1.6	105	17	66	3	25	0	66	62	.60	-1.95	.42	8	7	.0	0	12.6	ESE	54	SE	7	11	7	12	5.0	75	0
El Paso	3920	878.1	1005.6	95	66	80.8	+2.8	105	28	56	9	23	0	34	23	T	-.58	T	0	0	.0	0	11.6	WSW	36	SW	1	25	5	0	1.4	96	0
Fort Worth	688	988.2	1011.7	91	70	80.6	+.7	97	9	60	4	21	0	67	69	4.12	+.77	1.83	9	13	.0	0	14.8	S	49	NNW	16	12	11	7	4.8	--	0
Galveston CO	7	------	------	85	78	81.5	+.8	88	26	67	12	0	0	--	--	1.72	-2.65	1.32	4	--	.0	0	12.9	---	33	NW	12	--	--	--	---	82	0
Galveston	7	1013.2	1013.8	87	78	82.1	+1.4	89	30	67	12	0	0	76	83	.72	-3.65	.31	4	4	.0	0	14.1	SSE	---	---	--	11	15	4	4.7	--	0
Houston CO	41	1008.5	------	90	75	82.4	+1.0	95	10	68	13	20	0	--	--	2.53	-2.04	1.08	8	5	.0	0	10.8	---	43	S	13	3	17	10	6.2	74	0
Houston	41	1010.8	1013.4	91	73	82.1	+2.2	96	17	67	6	22	0	73	80	3.32	.00	1.63	8	3	.0	0	12.7	S	---	---	--	0	23	7	6.4	--	0
Laredo	500	994.9	1009.0	98	75	86.7	+1.3	106	17	67	4	26	0	72	69	1.87	-.05	1.00	3	2	.0	0	17.2	SE	---	---	--	11	12	7	4.7	--	0
Lubbock	3238	899.8	1008.2	90	62	76.2	.0	104	29	51	3	18	0	56	58	4.19	+1.72	1.50	5	12	2.0	0	16.0	S	*45	NNW	18	11	14	5	4.3	--	8
Palestine CO	491	995.3	1012.9	89	71	80.3	+1.3	93	9	64	12	19	0	--	--	2.83	-.80	.86	7	6	.0	0	8.1	---	30	SE	12	3	19	8	5.8	76	0
Port Arthur CO	5	1012.2	------	88	76	82.3	+1.3	94	26	67	5	9	0	--	--	1.84	-2.96	1.01	6	3	.0	0	13.1	---	30	SE	24	7	16	7	5.2	67	0
Port Arthur	5	1012.9	1013.5	91	72	81.5	----	95	18	66	5	22	0	74	84	1.15	-----	.46	7	4	.0	0	10.0	S	---	---	--	4	17	9	6.2	--	0
San Angelo	1903	983.8	1009.4	93	69	81.4	+.5	102	9	60	2	24	0	63	60	4.29	+2.32	1.94	7	8	T	0	14.2	SSE	*55	SE	13	11	10	9	5.0	--	0
San Antonio	782	987.5	1011.7	92	72	81.9	+.9	99	21	64	3	22	0	70	74	7.07	+4.61	6.18	4	3	.0	0	10.9	SE	36	NE	12	6	15	9	6.0	67	0
Victoria	109	1007.8	1012.3	91	75	83.0	+.8	96	18	68	5	22	0	73	81	3.39	+.18	2.14	5	5	.0	0	9.7	SSE	*48	NNE	12	7	17	6	5.4	--	0
Waco	504	992.6	1010.8	92	72	81.6	-1.0	98	29	62	4	24	0	69	70	2.21	-.95	1.15	7	4	.0	0	14.3	S	---	---	--	7	15	8	5.6	--	0
Wichita Falls	1027	974.6	1010.1	89	67	78.4	-3.3	97	29	54	4	19	0	66	69	3.77	+.28	2.12	9	14	T	T	13.1	S	*40	WSW	19	13	10	7	4.6	--	2
UTAH																																	
Milford	5029	844.6	1011.4	82	47	64.5	-1.3	96	28	34	2	6	0	33	42	T	-.26	T	0	5	.0	0	7.8	S	---	---	--	13	15	2	3.7	--	93
Salt Lake City	4222	868.6	1010.7	78	50	63.7	-2.0	91	16	38	2	1	0	40	45	.09	-.64	.05	4	2	.0	0	6.7	SSE	34	S	24	13	10	7	4.4	76	93
Salt Lake City CO	4260	------	------	--	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	---	---	--	--	--	--	---	--	71
VERMONT																																	
Burlington	331	999.3	1014.0	75	54	64.1	-1.6	89	19	41	8	0	0	54	70	3.17	-.21	.96	14	4	.0	0	8.5	SSW	34	SW	21	3	11	16	7.2	48	80
VIRGINIA																																	
Cape Henry CO	16	1013.5	1014.2	80	67	73.3	+.4	97	24	58	7	7	0	--	--	6.29	+2.33	3.63	11	10	.0	0	----	---	52	NW	28	7	17	6	5.5	75	2
Lynchburg	947	981.4	1014.9	83	63	72.9	-.2	96	2	55	15	9	0	63	74	7.26	+3.47	2.04	17	12	T	0	7.6	SSW	56	SW	28	5	16	9	6.1	57	1
Norfolk CO	11	1011.5	------	84	67	75.4	+1.0	96	25	57	11	10	0	--	--	4.86	+.64	1.34	13	9	T	0	----	---	29	S	30	--	--	--	---	77	2
Norfolk	25	1013.5	1014.8	83	65	73.9	+1.2	96	28	53	12	9	0	64	76	4.42	+.20	1.09	12	10	.0	0	9.0	NE	--	---	--	5	17	8	6.0	--	4
Richmond CO	162	------	------	--	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	0
Richmond	160	1008.5	1014.5	85	64	74.3	+1.1	98	2	55	6	12	0	63	74	5.85	-----	1.80	11	8	T	T	7.3	SE	29	SE	29	4	14	12	6.5	65	0
Roanoke	1192	973.6	1014.8	84	61	72.9	+1.0	96	°2	52	1	9	0	62	73	5.37	+1.01	1.48	10	11	.0	0	5.1	W	--	---	--	7	15	8	7.2	--	0
Washington CO	72	------	------	--	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	9
Wash. Nat'l. AP	14	1010.5	1014.8	82	65	73.4	+1.2	96	2	55	11	7	0	62	73	6.69	+2.56	2.30	13	8	.0	0	8.0	S	39	NW	4	5	12	13	6.5	57	8
WASHINGTON																																	
Ellensburg	1727	953.6	1015.1	78	50	64.0	+2.2	91	30	42	1	1	0	44	51	.60	-.02	.39	3	1	.0	0	13.5	NW	---	---	--	14	8	8	4.5	--	71
Kelso	17	------	------	75	48	61.3	----	95	29	39	2	2	0	--	--	.34	-----	.21	5	0	.0	0	----	---	---	---	--	12	10	8	4.8	--	121
North Head CO	194	1010.8	1018.3	59	50	54.8	.0	78	28	48	29	0	0	--	--	.32	-1.96	.19	6	0	.0	0	13.9	---	41	N	14	3	11	16	7.1	42	301
Olympia	190	1010.2	1017.5	75	46	60.6	----	95	29	38	2	3	0	48	69	.05	-----	.04	3	0	.0	0	4.2	SSW	---	---	--	13	8	9	4.6	--	141
Port Angeles	11	1017.6	1018.3	62	48	55.3	----	79	29	45	19	0	0	49	81	.17	-----	.07	3	1	.0	0	12.8	WNW	---	---	--	12	6	12	5.3	--	286
Seattle	14	1016.6	1017.6	--	--	----	----	--	--	--	--	--	-	49	63	----	-----	----	--	--	---	-	6.8	NNW	---	---	--	--	--	--	---	--	---
Seattle CO	14	------	------	74	53	63.8	+2.4	93	29	49	1	2	0	--	--	.30	-1.03	.18	5	0	.0	0	7.5	---	24	N	27	17	4	9	4.1	74	82
Spokane	2357	946.5	1015.1	73	49	61.3	-1.5	86	30	39	1	0	0	42	52	1.04	-.24	.75	5	1	.0	0	6.9	NE	29	NW	23	12	7	11	5.2	59	129
Stampede Pass CO	3960	881.1	1018.8	62	44	53.0	----	78	29	37	7	0	0	--	--	1.03	-----	.43	8	1	T	T	11.4	---	26	---	°7	16	5	9	4.6	--	357
Stevenson CO	319	------	------	74	53	63.5	----	92	29	46	1	3	0	--	--	1.21	-----	1.07	3	0	.0	0	----	---	---	---	--	17	4	9	4.0	--	98
Tacoma CO	127	1010.5	1017.3	72	52	61.9	+3.2	91	30	45	2	1	0	--	--	.08	-1.38	1.05	3	0	.0	0	6.4	---	26	SW	30	15	7	8	4.1	71	122
Tatoosh CO	101	1015.2	1018.6	56	48	52.3	-.7	73	28	45	27	0	0	49	90	.51	-2.69	.27	9	0	.0	0	11.3	S	35	S	30	6	7	17	7.1	39	372
Walla Walla	1200	------	------	--	---	----	----	--	--	--	--	--	-	46	--	----	-----	----	--	--	---	-	7.2	S	---	---	--	--	--	--	---	--	---
Walla Walla CO	949	979.0	1014.6	79	56	67.4	+.9	94	30	42	1	1	0	--	--	2.48	+1.36	1.18	8	2	.0	0	5.0	---	34	W	23	18	6	6	3.7	77	47
Yakima	1061	975.6	1014.3	82	51	66.2	+1.2	95	30	38	1	3	0	42	46	2.03	+1.69	1.08	4	2	T	T	7.5	NNW	---	---	--	18	6	6	3.9	--	46
Seattle-Tacoma AP	379	1003.4	1017.8	73	49	61.1	----	92	29	40	2	2	0	48	67	.13	-----	.07	4	0	.0	0	8.9	SW	---	---	--	12	9	9	4.8	--	134
WEST VIRGINIA																																	
Charleston	950	979.7	1014.5	84	61	72.5	----	95	3	50	16	8	0	63	76	5.12	-----	1.36	14	11	.0	0	7.2	SW	*50	NW	27	5	10	15	6.9	--	3
Elkins	1969	945.5	1015.2	79	55	67.0	+1.4	89	3	43	16	0	0	60	81	7.74	2.68	1.86	17	14	.0	0	3.9	WNW	47	W	27	2	11	17	7.3	55	38
Huntington	565	------	------	86	61	73.6	+2.7	95	2	50	6	13	0	--	--	4.86	+.56	1.01	13	--	.0	0	----	---	--	---	--	--	--	--	---	--	1
Parkersburg CO	615	------	------	82	62	72.0	+.6	95	2	51	6	4	0	--	--	4.37	+.37	1.06	16	15	T	T	5.1	---	40	SW	22	7	9	14	6.5	66	3
Parkersburg	837	------	1012.8	--	--	----	----	--	--	--	--	--	-	62	--	----	-----	----	--	--	---	-	6.5	SSW	--	---	--	--	--	--	---	--	---
Petersburg	1013	978.7	------	83	58	70.5	----	97	3	47	16	6	0	--	--	6.60	-----	1.80	13	9	.0	0	----	---	--	---	--	4	12	14	6.8	--	11
WISCONSIN																																	
Green Bay	689	988.2	1013.7	73	50	61.3	-3.6	82	17	37	5	0	0	53	75	2.30	-1.40	.77	11	8	.0	0	12.2	NE	65	W	20	7	12	11	6.1	62	124
La Crosse CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	---	---	--	--	--	--	---	--	52
La Crosse	669	988.5	1013.0	75	55	65.2	-1.8	85	17	41	5	0	0	54	70	5.01	+.94	2.09	9	7	.0	0	11.1	E	*30	E	27	2	12	16	7.5	--	53
Madison CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	---	---	--	--	--	--	---	--	56
Madison	857	982.7	1014.0	76	53	64.2	-3.0	87	17	38	5	0	0	56	75	2.55	-1.21	.67	13	7	.0	0	8.6	W	33	W	24	2	15	13	7.0	54	68
Milwaukee CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	---	---	--	--	--	--	---	--	133
Milwaukee	674	988.5	1013.5	71	53	61.9	-.2	86	18	44	6	0	0	53	76	2.97	-.43	1.18	10	4	T	T	9.1	NNE	33	W	20	2	16	12	7.2	43	115

See footnotes at end of table.

CLIMATOLOGICAL DATA

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
WYOMING																																	
Casper	5322	836.4	1012.0	69	44	56.3	-7.3	83	15	28	2	0	3	37	55	1.53	+0.15	0.77	10	8	1.5	T	8.4	SW	--	---	--	6	15	9	5.8	--	263
Cheyenne	6139	811.7	1013.5	66	43	54.6	-5.8	83	16	25	2	0	3	41	67	1.76	+.15	.46	14	22	T	T	11.5	SSW	36	N	1	5	14	11	6.3	60	308
Lander	5563	835.1	1013.9	68	41	54.8	-5.7	81	16	25	3	0	4	38	57	1.75	+.60	1.76	11	3	17.9	11	7.0	---	58	S	5	10	9	11	5.3	76	303
Rock Springs	6741	794.1	1014.0	67	42	54.5	-4.9	81	16	26	3	0	4	33	51	.81	+.01	.47	4	3	.4	T	13.1	WSW	*43	WSW	29	10	8	12	5.5	--	314
Sheridan	3942	884.5	1015.1	69	43	55.8	-5.7	85	15	27	3	0	4	41	63	2.08	+.04	.84	14	12	3.2	T	8.4	NW	40	NW	°15	5	12	13	6.3	63	273
PACIFIC AREA																																	
Canton Island	9	1008.8	1009.2	90	78	84.2	----	96	12	73	24	17	0	75	78	5.19	-----	1.73	13	2	.0	0	----	---	--	---	--	2	17	11	6.4	--	0
Hilo	28	1014.2	1015.9	83	67	74.8	----	88	29	63	1	0	0	66	76	3.46	-----	.87	20	0	.0	0	5.4	SW	27	N	°29	5	15	10	6.3	46	0
Honolulu CO	12	------	------	82	72	76.8	+.2	84	21	70	16	0	0	--	--	1.08	+.16	.81	8	--	.0	0	----	---	--	---	--	--	--	--	---	--	0
Honolulu	7	1015.2	1016.0	84	71	77.8	----	86	18	68	29	0	0	65	66	.38	-----	.34	3	0	.0	0	11.0	ENE	34	SE	26	13	16	1	3.9	59	0
Lihue	115	1011.2	1016.2	82	70	76.4	----	84	29	66	28	0	0	67	74	1.10	-----	.29	16	0	.0	0	8.3	ENE	25	NE	°11	6	18	6	5.3	65	0
Wake Island	9	1014.2	1014.6	86	77	81.7	----	88	27	74	15	0	0	74	77	1.64	-----	.22	18	0	.0	0	13.4	ESE	--	---	--	9	15	6	5.1	--	0
WEST INDIES																																	
San Juan, P.R. CO	47	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	----	--	----	---	--	---	--	--	--	--	---	--	0
San Juan, P.R.	8	1014.2	1016.1	87	75	80.7	----	92	7	70	24	4	0	73	78	7.03	-----	2.06	16	9	.0	0	10.9	ESE	27	SE	23	3	19	8	6.4	56	0
ALASKA																																	
Anchorage	134	1011.2	1016.3	61	45	52.9	-.6	72	25	33	20	2	0	45	75	2.51	+1.81	.71	16	0	T	T	5.3	NW	29	S	17	1	5	24	8.9	30	357
Annette Island	110	1016.1	1020.3	63	48	55.5	+.7	76	6	42	16	7	0	46	73	4.97	+.25	2.37	9	0	.0	0	11.8	NW	--	---	--	5	5	20	7.2	--	277
Barrow	22	1016.3	1016.9	39	29	34.0	-.2	62	26	22	2	0	25	32	93	.05	-.23	.04	2	0	T	6	13.1	SE	31	SE	6	3	4	23	8.2	--	924
Bethel	21	1009.5	1010.8	61	46	53.1	+.5	79	25	38	19	2	0	44	76	2.01	+.80	.47	14	0	.0	0	8.6	S	*25	S	4	2	4	24	8.1	--	358
Cordova	40	1015.9	1018.0	55	41	48.2	-1.9	65	25	33	13	0	0	45	88	5.79	+.93	.70	23	0	.0	0	3.5	SW	--	---	--	0	3	27	9.0	--	500
Fairbanks	436	995.6	1012.5	70	45	57.1	-1.1	81	27	33	10	13	0	40	59	1.24	-.19	.40	11	3	T	0	7.5	SW	38	NW	28	4	11	15	7.1	35	234
Galena	120	1007.1	1011.9	68	47	57.5	+.2	82	26	38	11	9	0	41	58	1.12	-.23	.28	10	1	T	0	9.2	WSW	*45	ESE	6	7	11	12	6.2	--	222
Gambell	25	1011.9	1012.9	42	34	37.5	-.4	57	28	29	3	0	13	35	89	.77	.27	.22	7	0	.0	0	12.6	NE	30	NE	23	3	6	21	8.1	--	805
Juneau	15	1018.6	1019.5	60	44	52.2	-.8	76	5	39	3	3	0	44	77	4.06	+.40	.85	15	0	.0	0	6.1	N	31	SE	10	3	4	23	8.4	32	378
Kotzebue	10	1012.2	1012.9	56	43	49.6	+6.3	77	27	33	14	3	0	42	79	.24	-.28	.10	5	0	.0	0	12.6	W	--	---	--	8	11	11	6.1	--	454
McGrath	334	999.7	1012.2	66	45	55.1	-.6	83	26	36	24	9	0	44	69	2.73	+.61	1.26	10	2	.0	0	4.7	SW	*20	S	°1	5	2	23	7.8	--	284
Nome	13	1011.5	1012.2	56	42	49.0	+3.4	77	26	35	15	1	0	44	84	.61	-.51	.34	9	1	.0	0	8.8	SW	27	NE	8	6	11	13	6.5	--	474
Northway	1713	951.2	1014.2	64	43	53.9	-2.0	81	6	35	12	10	0	40	63	1.73	-.09	.72	10	2	.0	0	4.4	NW	--	---	--	1	3	26	8.8	--	329
St. Paul Island	22	1006.1	1007.1	48	38	43.2	+1.9	57	24	34	14	0	0	41	91	1.80	+.40	.26	19	0	.0	0	----	---	--	---	--	1	5	24	9.0	--	646
Umiat	337	1004.5	1017.6	55	36	45.7	-2.7	73	16	27	5	2	10	36	72	.56	-.08	.36	8	0	T	T	11.0	E	--	---	--	4	7	19	7.4	--	1657
Wales	9	1012.2	1012.9	45	34	39.6	+1.0	61	27	28	8	0	14	36	87	.19	-.47	.07	19	0	T	13	----	---	--	---	--	4	8	18	7.6	--	756
Yakutat	28	1018.6	1019.2	53	44	48.5	-1.7	59	22	34	19	0	0	46	80	7.10	+2.28	2.29	22	0	.0	0	7.7	WSW	*44	ESE	10	1	1	28	9.4	--	488

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
** Peak gust.
° Other dates also.

DEGREE DAYS

(Base 65°F.)

Table 3

JUNE 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	0	2906	2556
Mobile (CO)	0	1691	1590
Mobile	0	1777	
Montgomery (CO)	0	2173	2052
Montgomery	0	2335	2071
ARIZONA			
Flagstaff	248	6827	7182
Payson (CO)	33	3504	3764
Phoenix (CO)	0	1019	1433
Phoenix	0	1145	
Prescott	47	3958	4485
Tucson	0	1419	1715
Winslow	23	4137	4679
Yuma	0	640	1038
ARKANSAS			
Ft. Smith	0	3478	3212
Little Rock	0	3186	2998
Texarkana	0	2637	2486
CALIFORNIA			
Bakersfield	0	1767	2163
Beaumont (CO)	35	2474	2921
Bishop	14	3586	4346
Blue Canyon	103	5218	5804
Burbank	8	1468	
Eureka (CO)	348	4477	4758
Fresno	2	2256	2410
Los Angeles (CO)	7	1131	1502
Los Angeles	22	1661	1937
Mt. Shasta (CO)	85	5417	6027
Oakland	132	2677	3087
Red Bluff	0	2504	2789
Sacramento (CO)	9	2316	2685
Sacramento	9	2469	
Sandberg (CO)	75	3795	
San Diego	4	1226	1682
San Francisco (CO)	257	3096	3174
San Francisco	177	2998	3397
San Jose	47	3183	
Santa Catalina	182	2316	2538
Santa Maria	163	2683	3043
COLORADO			
Alamosa	228	8193	8522
Colorado Springs	198	6473	6227
Denver	164	5983	5814
Grand Junction	49	5310	5625
Pueblo	81	5543	5548
CONNECTICUT			
Bridgeport	40	5219	
Hartford	54	5561	6096
New Haven	53	5389	5873
DELAWARE			
Wilmington	19	4990	4921
DIST. OF COLUMBIA			
Washington (CO)	9	4088	4514
Washington	8	4108	4158
FLORIDA			
Apalachicola	0	1442	1214
Daytona Beach	0	1083	627
Fort Myers	0	491	277
Jacksonville (CO)	0	1261	1132
Jacksonville	0	1380	
Key West (CO)	0	85	46
Key West	0	104	
Melbourne	0	699	405
Miami (CO)	0	299	182
Miami Beach	0	168	
Int. Airport, Hialeah	0	254	
Orlando	0	796	449
Pensacola (CO)	0	1531	1457
Tallahassee	0	1616	1469
Tampa	0	673	551
West Palm Beach	0	317	158
GEORGIA			
Albany	0	1961	1651
Atlanta (CO)	0	3129	2969
Atlanta	0	2987	
Athens	0	3112	2802
Augusta	0	2637	2274
Columbus	0	2555	2116
Macon	0	2321	2228
Rome	0	3429	3049
Savannah	0	2045	1633
Valdosta	0	1781	
IDAHO			
Boise	106	5500	5883
Lewiston	103	5129	5670
Pocatello	174	6563	6929
ILLINOIS			
Cairo (CO)	3	4113	3942
Chicago (CO)	70	6272	6291
Chicago	44	6630	
Chicago University	81	6510	
Joliet	47	6915	6617
Moline	37	6878	6428
Peoria	24	6455	5987
Springfield (CO)	9	5677	5414
Springfield	15	6069	
INDIANA			
Evansville	5	4979	4415
Ft. Wayne	26	6473	6230
Indianapolis (CO)	11	5582	5458
Indianapolis	13	5962	5617
South Bend	53	6688	6579
Terre Haute	15	5841	5137
IOWA			
Burlington	34	6688	5812
Charles City (CO)	71	8243	7624
Davenport (CO)	35	6637	6224
Des Moines	54	6978	6417
Dubuque	79	7464	6910
Keokuk (CO)	31	6332	5663
Sioux City	68	7336	6982
KANSAS			
Concordia (CO)	44	5539	5401
Dodge City	50	5148	5084
Goodland	134	6151	5656
Topeka (CO)	19	5155	5101
Topeka	20	5401	
Wichita	19	4781	4653
KENTUCKY			
Lexington	0	5054	4763
Louisville (CO)	0	4624	4403
Louisville	0	4778	
Pikeville (CO)	0	3939	
LOUISIANA			
Baton Rouge	0	1690	1441
Lake Charles	0	1554	1545
New Orleans (CO)	0	1226	1224
New Orleans	0	1392	
Int.Airport,Moisant	0	1431	
Shreveport	0	2258	2132
MAINE			
Caribou	233	9108	9906
Eastport	265	7343	8391
Greenville (CO)	207	8823	9439
Portland	171	6995	7583
MARYLAND			
Baltimore (CO)	10	4144	4451
Baltimore	17	4612	
Frederick	7	4875	
MASSACHUSETTS			
Boston	63	5136	5936
Milton	113	6192	
Nantucket	140	5411	5869
Pittsfield	128	7196	7763
MICHIGAN			
Alpena (CO)	136	7902	8243
Detroit	32	6332	6618
Escanaba (CO)	167	8679	8752
Grand Rapids (CO)	33	6411	6702
Grand Rapids	58	6886	
Lansing	50	6984	7142
Marquette (CO)	259	8810	8747
Muskegon	89	7034	7047
Sault Ste. Marie	238	9137	9290
Ypsilanti	28	6475	6528
MINNESOTA			
Duluth (CO)	263	10181	9526
Duluth	228	10476	
International Falls	188	11012	10563
Minneapolis	78	8538	7989
Rochester	85	8825	8155
St. Cloud	131	9531	8881
St. Paul	74	8505	7965
MISSISSIPPI			
Jackson	0	2300	2166
Meridian	0	2448	2222
Vicksburg	0	2211	2054
MISSOURI			
Columbia	14	5419	5034
Kansas City	20	5144	4978
St. Joseph	21	5703	5331
St. Louis (CO)	7	4980	4575
St. Louis	7	5145	
Springfield	15	4878	4587
MONTANA			
Billings	246	7676	7058
Butte	486	10184	9579
Glasgow (CO)	177	9816	8724
Great Falls	326	8323	7418
Havre (CO)	251	9056	8438
Helena	336	8766	7930
Kalispell	308	8211	8032
Missoula	270	7936	7638
NEBRASKA			
Grand Island	87	6545	
Lincoln (CO)	53	6204	6109
Lincoln	62	6535	
Norfolk	86	7162	6971
North Platte	124	6594	6321
Omaha	57	6594	6237
Valentine (CO)	172	7478	7218
NEVADA			
Elko	206	6706	7591
Ely	241	7087	7824
Las Vegas	0	2244	2582
Reno	104	5465	5589
Winnemucca	136	5858	6339
Tonopah			5812
NEW HAMPSHIRE			
Concord	108	6825	7377
Mt. Washington	648	13220	13698
NEW JERSEY			
Atlantic City	29	4445	5015
Newark	27	4796	5500
Trenton	29	4822	5105
NEW MEXICO			
Albuquerque	5	3771	4420
Clayton	71	5028	4949
Roswell	11	3350	3578
Raton	136	6119	6294
NEW YORK			
Albany	60	6515	6686
Bear Mountain (CO)	89	6281	6560
Binghamton (CO)	69	6316	6825
Binghamton	104	6741	
Buffalo	42	6423	6965
New York (CO)	29	4620	5280
La Guardia Field	21	4489	
Oswego	78	6577	7186
Rochester	53	6503	6757
Schenectady (CO)	50	6347	
Syracuse	65	6603	6879
NORTH CAROLINA			
Asheville (CO)	2	4222	4236
Asheville	7	4550	4056
Charlotte	0	3291	3178
Greensboro	1	3941	3856
Hatteras (CO)	1	2538	2516
Raleigh (CO)	0	3202	3289
Raleigh	0	3483	
Wilmington (CO)	0	2415	2399
Winston-Salem	2	3773	3533
NORTH DAKOTA			
Bismarck	189	10050	8981
Devils Lake (CO)	204	10726	10133
Fargo	147	9925	9331
Grand Forks	156	10252	9871
Williston (CO)	185	10054	9309
OHIO			
Akron	43	6538	6215
Cincinnati (CO)	0	4756	4941
Cincinnati	2	5425	
Cleveland (CO)	28	5856	6144
Cleveland	26	6020	6413
Columbus	13	5786	5535
Dayton	10	5991	5484
Sandusky (CO)	15	5869	6095
Toledo	25	6407	6290
Youngstown	44	6482	6327
OKLAHOMA			
Oklahoma City (CO)	8	3537	3664
Oklahoma City	6	3672	
Tulsa	5	3747	3582
OREGON			
Baker (CO)	227	6760	7197
Baker	228	7086	
Burns (CO)	152	6635	7215
Eugene	75	4292	4891
Meacham	299	7567	8107
Medford	36	4173	4662
Pendleton	59	5095	5263
Portland (CO)	48	3991	4355
Portland	64	4410	
Roseburg (CO)	39	3695	4318
Salem	85	4491	4803
Sexton Summit (CO)	138	5975	6631
Troutdale	83	4471	4949
PENNSYLVANIA			
Allentown	45	5635	5783
Curwensville	82	7328	7375
Erie (CO)	36	5926	6321
Harrisburg	28	5268	5402
Park Place	100	6759	6920
Philadelphia (CO)	21	4387	4739
Philadelphia	19	4574	
Pittsburgh (CO)	2	5108	5339
Pittsburgh	5	5587	5658
Reading (CO)	24	4853	5178
Scranton (CO)	49	5750	6187
Williamsport	45	5951	6051
RHODE ISLAND			
Block Island	92	5139	5827
Providence (CO)	54	4988	5919
Providence	74	3384	
SOUTH CAROLINA			
Charleston (CO)	0	2031	1840
Charleston	0	2290	
Columbia (CO)	0	2548	2459
Columbia	0	2747	
Florence	0	2671	
Spartanburg	0	3280	2969
Greenville			3039
SOUTH DAKOTA			
Huron	130	8388	7801
Pierre	150	7785	7283
Rapid City	220	7625	7251
Sioux Falls	124	8221	
TENNESSEE			
Bristol	2	4421	4147
Chattanooga	0	3423	3195
Memphis	0	3384	3118
Nashville	0	3987	3607
Knoxville			3624
TEXAS			
Abilene	5	2496	2599
Amarillo	29	4100	4215
Austin	0	1601	1679
Big Spring	6	2541	2637
Brownsville	0	625	628
Corpus Christi	0	904	967
Dallas	0	2298	2354
TEXAS (Cont'd.)			
Del Rio (CO)	0	1391	1500
El Paso	0	2373	2532
Ft. Worth	0	2328	2353
Galveston (CO)	0	1115	1170
Galveston	0	1151	
Houston (CO)	0	1206	
Houston	0	1363	1331
Laredo	0	839	886
Lubbock	[illegible]	3565	3670
Palestine (CO)	0	1962	2068
Port Arthur (CO)	0	1296	1336
Port Arthur	0	1511	1336
San Angelo	0	2227	2339
San Antonio	0	1564	1445
Victoria	0	1104	
Waco	0	1999	2074
Wichita Falls	2	2989	2991
UTAH			
Milford	93	5933	6689
Salt Lake City (CO)	71	5073	5542
Salt Lake City	93	5446	6079
VERMONT			
Burlington	80	7246	7895
VIRGINIA			
Cape Henry	2	3397	3505
Lynchburg	1	4313	4007
Norfolk (CO)	2	3146	3364
Norfolk	4	3464	
Richmond (CO)	0	3751	3874
Richmond	0	3923	
Roanoke	0	4341	4133
WASHINGTON			
Ellensburg	71	6766	6935
Kelso	119	4965	5454
North Head (CO)	301	5360	5174
Olympia	141	5377	5710
Port Angeles	286	5877	6037
Seattle (CO)	82	4311	4815
Seattle	134	5319	4499
Spokane	129	6534	6373
Stampede Pass (CO)	357	9102	9581
Stevenson (CO)	98	4949	5391
Tacoma (CO)	122	4799	5039
Tatoosh Island (CO)	372	5955	5911
Walla Walla (CO)	47	4620	4928
Yakima	46	5878	5640
WEST VIRGINIA			
Charleston	3	4450	4195
Elkins	38	5898	5791
Huntington	1	4133	
Parkersburg (CO)	3	4880	4928
Petersburg	11	5062	4835
WISCONSIN			
Green Bay	124	8671	7931
La Crosse (CO)	52	7743	7421
La Crosse	53	8228	
Madison (CO)	56	7665	7407
Madison	68	7886	
Milwaukee (CO)	133	7340	7144
Milwaukee	115	7572	
WYOMING			
Casper	263	7656	7592
Cheyenne	308	7600	7545
Lander	303	7786	8258
Rock Springs (CO)	262	7361	
Rock Springs	314	8122	8324
Sheridan	273	7770	7582
ALASKA			
Anchorage	357	11800	11146
Annette Island	277	7556	7034
Barrow	924	19746	20040
Bethel	358	12846	12902
Cordova	500	10745	9855
Fairbanks	234	14819	14270
Galena	222	14950	14871
Gambell	805	14551	15090
Juneau	378	9772	8963
Kotzebue	454	15286	16128
McGrath	284	14378	14379
Nome	474	13617	14249
Northway	329	16139	15407
St. Paul	646	10641	10977
Yakutat	488	9900	9758
Umiat	1657	21480	18920
Wales	756	15279	15923

Data from airport unless otherwise specified. CO indicates data from city office.

MONTHLY AND SEASONAL HEATING DEGREE DAYS

Table 3A

1950 – 1951

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Long-Terms Mean July-June
ALABAMA														
Birmingham	0	0	1	43	535	772	557	447	326	186	39	0	2906	2556
Mobile (CO)	0	0	0	1	314	473	354	301	165	81	2	0	1691	1590
Mobile	0	0	0	2	341	492	359	299	187	95	2	0	1777	
Montgomery (CO)	0	0	1	6	404	637	424	351	237	111	2	0	2173	2052
Montgomery	0	0	1	11	455	670	459	370	244	121	4	0	2335	2071
ARIZONA														
Flagstaff	44	94	304	392	716	901	1121	946	936	682	443	248	6827	7182
Payson (CO)	1	0	27	42	341	497	767	639	601	374	182	33	3504	3764
Phoenix (CO)	0	0	0	0	57	183	370	230	129	35	15	0	1019	1433
Phoenix	0	0	0	0	72	226	399	249	147	36	16	0	1145	
Prescott	0	0	51	69	429	613	849	688	640	388	184	47	3958	4485
Tucson	0	0	0	0	72	242	448	321	230	81	25	0	1419	1715
Winslow	0	0	28	56	540	769	893	709	634	342	143	23	4137	4679
Yuma	0	0	0	0	32	82	273	168	74	9	2	0	640	1038
ARKANSAS														
Ft. Smith	0	0	5	45	535	835	778	565	454	240	21	0	3478	3212
Little Rock	0	0	14	38	507	805	671	525	392	216	18	0	3186	2998
Texarkana	0	0	7	16	404	676	603	463	306	155	7	0	2637	2486
CALIFORNIA														
Bakersfield	0	0	4	22	148	379	522	333	231	91	37	0	1767	2163
Beaumont (CO)	0	0	25	49	182	279	554	496	406	289	159	35	2474	2921
Bishop	0	0	46	158	440	609	797	642	518	253	109	14	3586	4346
Blue Canyon	8	30	186	396	469	626	928	813	771	488	400	103	5218	5804
Burbank	0	0	7	19	133	165	367	307	229	161	72	8	1468	
Eureka (CO)	290	230	279	237	304	343	552	456	597	474	367	348	4477	4758
Fresno	0	0	10	41	211	428	598	416	348	146	56	2	2256	2410
Los Angeles (CO)	0	0	0	2	104	114	298	235	168	134	69	7	1131	1502
Los Angeles	0	8	8	42	153	184	340	322	251	194	137	22	1661	1937
Mt. Shasta (CO)	10	30	163	443	603	739	1012	777	776	415	364	85	5417	6027
Oakland	42	36	59	117	178	373	510	396	360	312	162	132	2677	3087
Red Bluff	0	0	8	96	257	498	647	456	332	131	79	0	2504	2789
Sacramento (CO)	0	2	8	72	205	442	579	402	326	191	80	9	2316	2685
Sacramento	0	2	9	88	228	454	602	422	357	211	87	9	2469	
Sandberg (CO)	0	2	122	171	307	449	745	641	594	433	256	75	3795	
San Diego	0	0	0	5	119	160	287	258	191	123	79	4	1226	1682
San Francisco (CO)	215	171	123	107	132	345	450	353	330	373	240	257	3096	3174
San Francisco	107	92	74	132	157	346	500	412	407	378	216	177	2998	3397
San Jose	3	8	27	81	144	363	460	372	330	242	106	47	3183	
Santa Catalina	30	33	86	56	118	168	381	350	317	341	254	182	2316	2538
Santa Maria	37	102	76	132	177	285	434	379	365	300	233	163	2683	3043
COLORADO														
Alamosa	82	162	317	475	981	1249	1351	1138	1040	739	431	228	8193	8522
Colorado Springs	38	33	194	227	795	932	1215	879	979	693	290	198	6473	6227
Denver	7	14	169	159	770	885	1175	866	898	628	248	164	5983	5814
Grand Junction	0	0	69	129	695	913	1220	954	739	391	151	49	5310	5625
Pueblo	0	4	87	155	782	936	1139	829	830	525	175	81	5543	5548
CONNECTICUT														
Bridgeport	0	0	134	261	563	973	986	864	793	430	175	40	5219	
Hartford	3	2	183	315	607	1024	1046	906	801	441	179	54	5561	6096
New Haven	1	1	148	282	588	980	1011	878	794	451	202	53	5389	5873
DELAWARE														
Wilmington	0	2	114	232	598	1001	948	838	717	396	125	19	4990	4921
DISTRICT OF COLUMBIA														
Washington (CO)	0	0	57	149	520	907	774	725	598	281	68	9	4088	4514
Washington	0	0	55	143	521	907	790	736	597	283	68	8	4108	4158
FLORIDA														
Apalachicola	0	0	0	0	243	386	318	302	127	66	0	0	1442	1214
Daytona Beach	0	0	0	0	171	316	220	222	105	49	0	0	1083	627
Fort Myers	0	0	0	0	88	157	125	100	15	6	0	0	491	277
Jacksonville (CO)	0	0	0	0	245	382	244	264	95	31	0	0	1261	1132
Jacksonville	0	0	0	0	255	408	269	282	121	45	0	0	1380	
Key West (CO)	0	0	0	0	8	13	31	33	0	0	0	0	85	46
Key West	0	0	0	0	10	19	32	43	0	0	0	0	104	
Melbourne	0	0	0	0	114	216	151	133	63	22	0	0	699	405
Miami (CO)	0	0	0	0	61	67	85	73	8	5	0	0	299	182
Miami Beach	0	0	0	0	31	43	54	39	1	0	0	0	168	
Miami Int. Airport, Hialeah	0	0	0	0	53	61	79	55	4	2	0	0	254	
Orlando	0	0	0	0	137	232	175	157	70	25	0	0	796	449
Pensacola (CO)	0	0	0	0	290	429	292	280	157	82	1	0	1531	1457
Tallahassee	0	0	0	0	310	438	362	282	151	73	0	0	1616	1469
Tampa	0	0	0	0	125	210	146	131	42	19	0	0	673	551
West Palm Beach	0	0	0	0	67	85	80	58	21	6	0	0	317	158
GEORGIA														
Albany	0	0	1	5	368	573	398	343	182	91	0	0	1961	1651
Atlanta (CO)	0	0	21	39	544	773	620	489	410	200	33	0	3129	2969
Atlanta	0	0	14	31	525	749	602	484	373	190	19	0	2987	
Athens	0	0	31	31	522	752	649	515	391	201	20	0	3112	2802
Augusta	0	0	15	20	458	699	561	448	291	133	12	0	2637	2274
Columbus	0	0	3	14	485	692	498	416	283	155	9	0	2555	2116
Macon	0	0	5	11	433	646	471	396	254	103	5	0	2324	2228
Rome	0	0	9	57	611	832	696	540	404	235	45	0	3429	3049
Savannah	0	0	1	6	353	581	443	362	223	76	0	0	2045	1633
Valdosta	0	0	0	3	343	500	374	316	165	80	0	0	1781	
IDAHO														
Boise	10	9	142	261	662	884	1107	783	860	422	254	106	5500	5883
Lewiston	9	13	115	358	661	733	975	774	776	386	226	103	5129	5670
Pocatello	16	16	240	386	763	1004	1271	899	980	535	279	174	6563	6929
ILLINOIS														
Cairo (CO)	0	0	21	59	664	954	837	685	549	311	30	3	4113	3942
Chicago (CO)	3	9	41	186	843	1271	1196	1007	907	553	186	70	6272	6291
Chicago	3	15	65	225	913	1403	1283	1052	915	547	165	44	6630	
Chicago University	2	13	66	206	867	1319	1218	1035	924	574	205	81	6510	
Joliet	4	28	98	266	944	1490	1308	1083	931	551	165	47	6915	6617
Moline	4	24	82	222	930	1416	1372	1096	1020	543	132	37	6878	6428
Peoria	2	18	62	191	925	1364	1254	1033	931	528	123	24	6455	5987
Springfield (CO)	0	5	41	133	852	1249	1100	916	841	464	67	9	5677	5414
Springfield	2	18	71	181	902	1291	1142	957	876	509	105	15	6069	
INDIANA														
Evansville	0	5	43	120	747	1100	969	815	700	401	74	5	4979	4415
Ft. Wayne	8	20	111	262	902	1342	1161	1043	874	550	174	26	6473	6230
Indianapolis (CO)	0	4	61	160	813	1210	1048	915	796	475	89	11	5582	5458
Indianapolis	1	13	78	199	855	1281	1105	955	837	512	113	13	5962	5617
South Bend	15	18	103	270	908	1363	1209	1051	918	582	198	53	6688	6579
Terre Haute	0	14	64	183	860	1290	1080	918	814	491	112	15	5841	5137

Data from airport unless otherwise specified. CO indicates data from city office.

MONTHLY AND SEASONAL HEATING DEGREE DAYS

1950 - 1951

Table 3A

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Long-Terms Mean July-June
IOWA														
Burlington	6	24	79	211	932	1379	1315	1039	1019	529	121	34	6688	5812
Charles City (CO)	9	45	125	297	1030	1594	1670	1297	1282	692	131	71	8243	7624
Davenport (CO)	1	14	55	185	894	1385	1346	1061	1011	535	115	35	6637	6224
Des Moines (CO)	2	22	54											
Des Moines	3	31	65	204	929	1387	1380	1101	1122	587	115	54	6978	6417
Dubuque	3	25	75	234	942	1443	1483	1200	1168	639	173	79	7464	6910
Keokuk (CO)	2	8	47	142	851	1321	1235	1010	1001	563	121	31	6332	5663
Sioux City	6	30	96	288	975	1362	1480	1070	1197	630	134	68	7336	6982
KANSAS														
Concordia (CO)	2	13	50	141	766	1032	1163	867	893	485	83	44	5539	5401
Dodge City	0	16	53	131	731	925	1117	756	808	459	102	50	5148	5084
Goodland	8	20	125	220	823	969	1201	890	961	601	199	134	6151	5656
Topeka (CO)	0	6	32	109	719	1038	1072	822	827	452	59	19	5155	5101
Topeka	0	12	50	143	745	1080	1109	859	835	462	86	20	5401	
Wichita	0	10	28	99	672	937	1010	757	772	408	69	19	4781	4653
KENTUCKY														
Lexington	0	6	62	128	792	1089	926	826	711	425	89	0	5054	4763
Louisville (CO)	0	0	38	102	702	1026	881	767	669	374	65	0	4624	4403
Louisville	0	1	40	115	737	1061	900	793	674	389	68	0	4778	
Pikeville (CO)	0	0	27	58	670	910	749	646	518	303	58	0	3939	
LOUISIANA														
Baton Rouge	0	0	0	0	292	469	365	275	198	91	0	0	1690	1441
Lake Charles	0	0	0	0	246	396	378	287	170	77	0	0	1554	1545
New Orleans (CO)	0	0	0	0	219	358	236	234	130	49	0	0	1226	1224
New Orleans	0	0	0	0	257	414	262	257	132	69	1	0	1392	
New Orleans Int'l. Moisant	0	0	0	0	260	391	298	255	159	68	0	0	1431	
Shreveport	0	0	2	10	352	594	513	411	246	126	1	0	2258	2132
MAINE														
Caribou	78	128	439	687	858	1318	1589	1388	1233	709	448	233	9108	9906
Eastport	124	135	334	513	644	1006	1176	1045	990	639	472	265	7343	8391
Greenville (CO)	59	142	442	614	834	1324	1521	1272	1215	748	445	207	8823	9439
Portland	26	45	312	484	699	1096	1220	1045	976	574	347	171	6995	7583
MARYLAND														
Baltimore (CO)	0	0	61	147	497	894	806	749	611	295	74	10	4144	4451
Baltimore	0	1	85	207	572	973	862	791	665	338	101	17	4612	
District Heights *	0	1												
Frederick	0	0	85	231	613	1014	921	818	678	390	118	7	4875	
Riverdale *	0	1												
Takoma Park *	0	2												
MASSACHUSETTS														
Boston	0	4	149	281	512	905	953	841	797	416	215	63	5136	5936
Milton (Blue Hill Obs.)	8	27	234	386	617	1038	1060	969	913	533	294	113	6192	
Nantucket	9	15	174	323	495	859	898	827	808	532	331	140	5411	5869
Pittsfield	14	60	313	458	758	1222	1229	1077	1005	598	304	128	7196	7763
MICHIGAN														
Alpena (CO)	55	113	268	413	904	1279	1383	1194	1107	720	330	136	7902	8243
Detroit	9	16	106	284	849	1218	1148	1038	878	562	192	32	6332	6618
Escanaba (CO)	93	178	257	464	1028	1413	1503	1283	1189	759	345	167	8679	8752
Grand Rapids (CO)	8	27	110	269	869	1222	1197	1027	913	565	171	33	6411	6702
Grand Rapids	27	41	155	328	911	1276	1252	1067	957	609	202	58	6886	
Iron Mountain *	90	163	251	485	1127	1516	1579	1310						
Lansing	22	48	154	339	925	1305	1250	1110	960	612	209	50	6984	7142
Marquette (CO)	131	217	249	476	1036	1360	1455	1267	1213	782	365	259	8810	8747
Muskegon	48	58	163	353	888	1231	1242	1088	988	650	236	89	7034	7047
Sault Ste. Marie	137	226	328	534	1041	1435	1563	1333	1207	732	363	238	9137	9290
Traverse City	63	118	211	401	966	1245	1356	1181						
Ypsilanti	8	20	111	299	870	1273	1169	1055	896	573	173	28	6475	6528
MINNESOTA														
Duluth (CO)	145	204	254	565	1230	1699	1804	1407	1401	798	411	263	10181	9526
Duluth	132	229	298	588	1277	1771	1855	1454	1446	830	368	228	10476	
International Falls	95	230	305	616	1371	1925	2025	1546	1517	894	320	188	11012	10563
Minneapolis	8	46	100	358	1113	1627	1721	1327	1353	675	132	78	8538	7989
Rochester	13	71	138	356	1123	1675	1781	1353	1348	724	158	85	8825	8155
St. Cloud	23	98	170	479	1222	1719	1892	1419	1450	738	190	131	9531	8881
St. Paul	8	50	101	352	1102	1617	1732	1328	1342	675	124	74	8505	7965
MISSISSIPPI														
Jackson	0	0	0	17	393	636	486	381	242	142	3	0	2300	2166
Meridian	0	0	2	25	443	672	500	394	249	152	11	0	2448	2222
Vicksburg	0	0	1	14	364	626	467	372	226	135	6	0	2211	2054
MISSOURI														
Columbia (CO)	0	11	43	130	785	1068								
Columbia	1	10	61	139	825	1126	1053	844	812	458	76	14	5419	5034
Kansas City	0	5	34	116	720	1056	1057	839	803	439	55	20	5144	4978
St. Joseph	0	13	53	148	790	1146	1158	921	893	485	75	21	5703	5331
St. Louis (CO)	0	3	25	102	769	1087	981	800	741	410	55	7	4980	4575
St. Louis	0	1	37	117	796	1114	996	824	765	427	58	7	5145	
Springfield	0	9	61	120	745	1001	964	750	687	429	97	15	4878	4587
MONTANA														
Billings	32	20	286	409	984	1035	1376	1041	1313	685	249	246	7676	7058
Butte	194	188	503	673	1165	1265	1698	1243	1373	840	556	486	10184	9579
Glasgow (CO)	30	67	266	523	1221	1521	1811	1598	1617	742	243	177	9816	8724
Great Falls	53	60	310	486	994	989	1449	1149	1422	720	365	326	8323	7418
Havre (CO)	35	36	282	531	1160	1262	1672	1353	1498	701	275	251	9056	8438
Helena	61	48	360	528	1177	1187	1487	1109	1356	723	394	336	8766	7930
Kalispell	68	56	315	623	1016	1103	1423	1035	1155	676	433	308	8211	8032
Missoula	59	34	304	569	1052	1119	1424	978	1086	633	408	270	7936	7638
NEBRASKA														
Grand Island	4	19	94	255	895	1151	1346	934	1039	576	145	87	6545	
Lincoln (CO)	2	19	64	191	848	1160	1300	933	991	548	95	53	6204	6109
Lincoln	2	21	92	232	890	1187	1354	969	1028	578	120	62	6535	
Norfolk	9	20	99	273	962	1293	1417	1026	1195	633	149	86	7162	6971
North Platte	10	22	133	288	914	1065	1251	929	1028	623	207	124	6594	6321
Omaha	1	19	77	202	876	1252	1380	1008	1055	573	94	57	6594	6237
Valentine (CO)	41	28	182	329	955	1185	1398	1006	1236	691	255	172	7478	7218
NEVADA														
Elko	14	18	296	452	755	921	1253	903	939	553	396	206	6706	7591
Ely	35	54	319	422	776	929	1221	992	1008	641	449	241	7087	7824
Las Vegas	0	0	0	3	250	419	650	486	319	84	33	0	2244	2582
Reno	5	18	201	355	579	810	980	795	818	452	348	104	5465	5589
Tonopah	9	41	255	454	742	882	1044	774	741					
Winnemucca	3	17	227	395	654	837	1050	840	894	471	334	136	5858	6339
NEW HAMPSHIRE														
Concord	17	22	287	439	707	1129	1229	1048	971	574	294	108	6825	7377
Mt. Washington	525	511	777	1016	1212	1627	1746	1430	1574	1223	931	648	13220	13698

Data from airport unless otherwise specified. CO indicates data from city office. * from cooperative stations.

MONTHLY AND SEASONAL HEATING DEGREE DAYS

1950 – 1951

Table 3A

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Long-Terms Means July-June
NEW JERSEY														
Atlantic City	0	0	77	163	477	870	822	766	698	404	139	29	4445	5015
Newark	0	0	100	219	546	973	910	819	717	369	116	27	4796	5500
Trenton	0	1	118	224	544	971	902	814	715	380	124	29	4822	5105
NEW MEXICO														
Albuquerque	0	0	27	20	495	697	874	699	572	301	81	5	3771	4420
Clayton	3	15	81	132	651	829	1060	725	787	499	175	71	5028	4949
Roswell	0	0	1	36	480	663	820	605	466	226	42	11	3350	3578
Raton	21	21	143	230	755	931	1214	845	905	620	298	136	6119	6294
NEW YORK														
Albany	12	12	215	380	707	1218	1204	1057	916	514	220	60	6515	6686
Bear Mountain (CO)	12	19	220	332	700	1156	1097	1002	911	512	231	89	6281	6560
Binghamton (CO)	13	21	199	342	718	1219	1093	1004	909	507	222	69	6316	6825
Binghamton	22	42	222	393	756	1291	1135	1025	928	554	269	104	6741	
Buffalo	13	20	155	324	777	1168	1124	1045	917	592	246	42	6423	6965
Canton (CO)	12	48	236	452										
New York (CO)	0	0	87	174	519	924	877	790	721	378	121	29	4620	5280
La Guardia Field	0	0	87	180	500	905	862	789	698	339	108	21	4489	
Oswego	13	17	198	357	705	1166	1146	1079	916	600	302	78	6577	7186
Rochester	9	20	169	349	754	1191	1158	1082	908	573	237	53	6503	6757
Schenectady (CO)	7	12	212	371	682	1160	1198	1047	898	506	204	50	6347	
Syracuse	8	15	202	357	715	1241	1182	1101	921	547	249	65	6603	6879
NORTH CAROLINA														
Asheville (CO)	0	0	54	119	681	931	807	654	538	332	104	2	4222	4236
Asheville	0	1	72	175	723	964	848	695	564	360	141	7	4550	4056
Charlotte (CO)	0	0	38	47	492	780	662	528	395	168				
Charlotte	0	0	40	60	530	809	698	531	415	179	29	0	3291	3178
Greensboro	0	0	62	112	610	903	777	638	519	270	49	1	3941	3856
Hatteras (CO)	0	0	8	12	287	639	504	509	416	145	17	1	2538	2516
Raleigh (CO)	0	0	46	61	475	789	642	545	436	179	29	0	3202	3289
Raleigh	0	0	55	83	519	841	671	573	478	222	41	0	3483	
Wilmington (CO)	0	0	22	14	379	674	485	415	310	108	8	0	2415	2399
Winston-Salem	0	0	63	100	585	863	756	603	503	252	46	2	3773	3533
NORTH DAKOTA														
Bismarck	41	54	232	496	1280	1640	1925	1517	1680	739	257	189	10050	8981
Devils Lake (CO)	63	111	251	598	1369	1815	2029	1593	1641	797	255	204	10726	10133
Fargo	26	82	166	536	1274	1805	1981	1447	1523	735	203	147	9925	9331
Grand Forks	6	105	216	575	1322	1828	2015	1520	1507	768	234	156	10252	9871
Pembina	65	140	267											
Williston (CO)	50	97	274	555	1243	1578	1835	1514	1680	765	278	185	10054	9309
OHIO														
Akron	7	33	137	310	895	1299	1135	1012	877	582	198	43	6538	6215
Cincinnati (CO)	0	0	46	110	736	1053	902	797	665	381	66	0	4756	4941
Cincinnati	0	15	82	169	814	1166	994	865	763	455	100	2	5425	
Cleveland (CO)	4	7	90	222	780	1160	1061	949	832	536	187	28	5856	6144
Cleveland	2	18	77	246	828	1231	1080	976	828	540	168	26	6020	6413
Columbus (CO)	0	3	68	182	806	1179	1003	909	734	464				
Columbus	3	14	100	220	837	1239	1035	948	773	485	119	13	5786	5535
Dayton	2	13	94	209	871	1271	1093	970	816	515	127	10	5991	5484
Sandusky (CO)	4	5	62	222	803	1206	1068	974	811	531	168	15	5869	6095
Toledo	8	18	105	281	872	1293	1146	1039	877	563	180	25	6407	6290
Youngstown	5	37	148	322	868	1268	1116	1013	889	579	193	44	6482	6327
OKLAHOMA														
Oklahoma City (CO)	0	4	3	43	527	774	776	613	507	255	27	8	3537	3664
Oklahoma City	0	3	3	41	539	787	803	650	539	269	32	6	3672	
Tulsa	0	5	1	50	556	849	808	633	530	275	35	5	3747	3582
OREGON														
Baker (CO)	53	37	236	434	786	918	1224	928	989	544	384	227	6760	7197
Baker	49	49	309	488	829	918	1290	958	1021	573	374	228	7086	
Burns (CO)	35	33	208	469	783	951	1265	921	978	485	355	152	6635	7215
Eugene	15	14	117	373	525	530	749	581	706	342	265	75	4292	4891
Meacham	99	82	263	576	856	908	1267	982	1085	645	505	299	7567	8107
Medford	3	7	79	326	538	650	799	631	655	238	211	36	4173	4662
Pendleton	7	7	94	385	685	791	966	763	750	379	209	59	5095	5263
Portland (CO)	12	12	90	352	510	516	757	559	669	259	207	48	3991	4355
Portland	20	17	121	382	548	571	776	612	709	337	253	64	4410	
Roseburg (CO)	8	5	80	283	446	480	699	547	623	282	203	39	3695	4318
Salem	14	17	126	403	542	537	774	606	740	366	281	85	4491	4803
Sexton Summit (CO)	82	72	204	530	632	706	1012	809	875	433	482	138	5975	6631
Troutdale	27	18	131	391	547	604	795	631	705	306	233	83	4471	4949
PENNSYLVANIA														
Allentown	3	7	142	290	667	1112	1041	921	803	451	153	45	5635	5783
Curwensville	51	68	276	414	925	1336	1179	1088	997	642	270	82	7328	7375
Erie (CO)	10	8	101	244	759	1131	1046	966	843	558	224	36	5926	6321
Harrisburg	0	7	117	271	646	1074	973	877	742	400	133	28	5268	5402
Park Place	23	43	234	359	766	1265	1155	1033	967	587	227	100	6759	6920
Philadelphia (CO)	0	0	85	166	509	916	848	762	667	328	85	21	4387	4739
Philadelphia	0	1	93	187	536	945	890	793	675	342	93	19	4574	
Pittsburgh (CO)	0	4	78	204	730	1084	911	828	713	441	113	2	5108	5339
Pittsburgh	0	9	101	238	802	1155	989	885	779	484	140	5	5587	5658
Reading (CO)	0	4	103	230	573	1008	911	828	711	362	99	24	4853	5178
Scranton (CO)	2	14	169	298	668	1124	1037	928	835	460	166	49	5750	6187
Williamsport	2	13	163	326	717	1185	1089	970	823	467	151	45	5951	6051
RHODE ISLAND														
Block Island	1	2	125	256	483	862	901	830	813	505	269	92	5139	5827
Providence (CO)	0	3	163	272	512	915	929	807	758	386	189	54	4988	5919
Providence	3	5	182	303	560	960	978	857	801	438	223	74	3384	
SOUTH CAROLINA														
Charleston (CO)	0	0	2	3	330	585	431	390	232	58	0	0	2031	1840
Charleston	0	0	8	17	377	619	485	409	264	105	6	0	2290	
Columbia (CO)	0	0	21	23	418	682	544	426	300	124	10	0	2548	2459
Columbia	0	0	22	35	455	725	585	469	313	133	10	0	2747	
Florence	0	0	33	34	427	722	558	449	320	123	5	0	2671	
Greenville	0	0	31	41	533	794	697	553	410	205	20			3039
Spartanburg	0	0	26	53	537	798	709	551	399	183	24	0	3280	2969
SOUTH DAKOTA														
Huron	15	40	146	396	1117	1508	1671	1157	1415	681	212	130	8388	7801
Pierre	18	20	136	326	965	1367	1474	1078	1407	667	177	150	7785	7283
Rapid City	44	32	233	347	981	1116	1367	1039	1245	725	276	220	7625	7251
Sioux Falls	23	44	113	375	1073	1479	1607	1136	1379	675	193	124	8221	
TENNESSEE														
Bristol	0	1	60	139	735	987	809	671	558	353	106	2	4421	4147
Chattanooga (CO)	0	0	3	23	549	794								
Chattanooga	0	0	11	57	605	839	695	527	408	236	46	0	3423	3195
Knoxville	0	0	27	70	650	912	708	581	471	277	55			3624
Memphis	0	0	10	48	556	844	682	566	400	245	33	0	3384	3118
Nashville	0	0	19	69	676	945	763	647	483	325	60	0	3987	3607

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MONTHLY AND SEASONAL HEATING DEGREE DAYS

1950 – 1951

Table 3A

State and Station	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total for Season	Long-Terms Mean July–June
TEXAS														
Abilene	0	0	0	9	352	635	632	425	297	134	7	5	2496	2599
Amarillo	0	7	23	61	565	763	923	667	617	349	96	29	4100	4215
Austin	0	0	0	0	219	384	433	324	176	62	3	0	1601	1679
Big Spring	0	0	0	3	334	608	681	425	328	141	15	6	2541	2637
Brownsville	0	0	0	0	90	131	173	161	63	7	0	0	625	628
Corpus Christi	0	0	0	0	111	198	269	224	37	15	0	0	904	967
Dallas	0	0	0	5	347	571	572	423	260	115	5	0	2298	2354
Del Rio (CO)	0	0	0	0	194	362	407	275	131	22	0	0	1391	1500
El Paso	0	0	0	0	323	456	634	180	322	131	27	0	2373	2532
Ft. Worth	0	0	0	3	338	576	583	435	276	112	5	0	2328	2353
Galveston (CO)	0	0	0	0	135	254	295	278	118	35	0	0	1115	1170
Galveston	0	0	0	0	142	269	300	283	121	36	0	0	1151	
Houston (CO)	0	0	0	0	171	279	325	271	118	42	0	0	1206	
Houston	0	0	0	0	193	321	355	299	136	59	0	0	1363	1331
Laredo	0	0	0	0	106	207	246	195	82	3	0	0	839	886
Lubbock	0	0	4	47	496	762	844	581	507	267	49	8	3565	3670
Palestine (CO)	0	0	0	[illegible]	289	482	495	380	210	100	4	0	1962	2068
Port Arthur (CO)	0	0	0	0	190	333	325	267	133	48	0	0	1296	1336
Port Arthur	0	0	0	0	241	379	369	289	161	69	0	0	1511	1336
San Angelo	0	0	0	8	296	549	606	385	277	101	5	0	2227	2339
San Antonio	0	0	0	0	224	377	443	319	148	51	2	0	1564	1445
Victoria	0	0	0	0	149	256	311	250	111	27	0	0	1104	
Waco	0	0	0	1	296	504	531	382	202	79	4	0	1999	2074
Wichita Falls	0	0	0	12	436	713	706	525	401	184	10	2	2989	2991
UTAH														
Milford	0	0	147	276	681	1026	1181	894	876	497	262	93	5933	6689
Salt Lake City (CO)	3	0	113	177	645	894	1045	751	814	380	180	71	5073	5542
Salt Lake City	3	0	135	225	697	912	1092	795	861	435	198	93	5446	6079
VERMONT														
Burlington	7	39	294	445	736	1242	1316	1186	1000	599	302	80	7246	7895
VIRGINIA														
Alexandria E.H.S. *	0	0												
Cape Henry	0	0	20	44	431	776	621	625	551	265	62	2	3397	3505
Falls Church *	0	0												
Lynchburg	0	0	75	154	613	936	835	712	600	305	82	1	4313	4007
Norfolk (CO)	0	0	26	47	412	753	596	565	494	206	45	2	3146	3364
Norfolk	0	0	35	66	468	802	638	599	532	253	67	4	3464	
Potomac Yards (Alexandria) *	0	0												
Richmond (CO)	0	0	54	119	519	849	722	628	543	258	59	0	3751	3874
Richmond	0	0	60	138	538	886	739	660	559	267	76	0	3923	
Roanoke	0	0	91	142	653	938	815	703	599	327	73	0	4341	4133
Urbanna (CO)	0	0	54	116	492	858	692	652	550					
WASHINGTON														
Ellensburg	21	5	150	597	889	1010	1249	1019	943	502	310	71	6766	6935
Kelso	78	64	164	447	588	583	815	631	754	407	315	119	4965	5454
North Head (CO)	251	197	284	393	516	507	731	582	720	487	391	301	5360	5174
Olympia	81	62	219	491	638	611	853	676	796	464	345	141	5377	5710
Port Angeles	253	242	310	498	599	621	773	657	743	482	413	286	5877	6037
Seattle (CO)	26	24	128	382	542	520	758	582	686	337	244	82	4311	4815
Seattle	54	60	219	480	635	620	866	678	789	458	326	134	5319	4499
Spokane	27	10	144	561	857	966	1168	911	944	496	321	129	6534	6373
Stampede Pass (CO)	271	231	343	820	1026	1042	1329	1070	1178	759	676	357	9102	9581
Stevenson (CO)	37	19	104	400	615	704	869	705	748	364	286	98	4949	5391
Tacoma (CO)	56	44	171	418	575	549	810	615	740	408	291	122	4799	5039
Tatoosh Island (CO)	335	280	330	442	582	556	753	629	752	507	417	372	5955	5911
Walla Walla (CO)	0	1	76	334	645	740	905	715	694	311	152	47	4620	4928
Yakima	12	2	131	520	774	931	1127	838	834	423	240	46	5878	5640
WEST VIRGINIA														
Charleston	0	0	65	136	700	970	803	724	588	366	95	3	4450	4195
Elkins	14	32	162	311	833	1176	975	875	779	504	199	38	5898	5791
Huntington	0	2	39	103	667	955	749	720	538	303	56	1	4133	
Parkersburg (CO)	0	2	73	172	741	1062	889	803	647	404	84	3	4880	4928
Petersburg	6	4	110	272	695	1079	894	804	679	382	126	11	5062	4835
WISCONSIN														
Green Bay	50	140	212	426	1053	1580	1651	1326	1184	691	234	124	8671	7931
La Crosse (CO)	7	46	92	265	979	1531	1591	1241	1192	638	109	52	7743	7421
La Crosse	20	76	138	330	1050	1591	1670	1292	1237	658	113	53	8228	
Madison (CO)	14	56	116	292	985	1473	1528	1221	1137	617	170	56	7665	7407
Madison	16	53	130	323	1018	1516	1585	1260	1115	632	170	68	7886	
Milwaukee (CO)	26	45	113	263	928	1372	1375	1137	1033	659	256	133	7340	7144
Milwaukee	31	56	136	293	964	1437	1434	1154	1052	660	240	115	7572	
WYOMING														
Casper	35	38	303	387	931	1043	1374	987	1121	805	369	263	7656	7592
Cheyenne	85	73	300	375	889	965	1308	950	1103	822	422	308	7600	7545
Lander	38	24	355	418	1019	1023	1375	1034	1082	722	393	303	7786	8258
Rock Springs (CO)	26	25	286	448	879	1028	1328	958	1054	682	385	262	7361	
Rock Springs	45	42	348	450	946	1102	1458	1051	1155	768	443	314	8122	8324
Sheridan	34	34	306	403	997	1078	1409	1003	1211	726	296	273	7770	7582
ALASKA														
Anchorage	250	212	480	981	1584	1636	1855	1444	1622	825	554	357	11800	11146
Annette Island	290	220	313	643	929	789	1022	870	1014	680	509	277	7556	7034
Barrow	786	788	977	1348	1485	2326	2882	2442	2516	1850	1422	924	19746	20040
Bethel	264	279	555	958	1421	1735	2124	1476	1995	1053	628	358	12846	12902
Cordova	392	340	533	814	1305	1172	1480	1256	1374	883	696	500	10745	9855
Fairbanks	102	221	539	1205	2134	2186	2743	2036	2030	910	479	234	14819	14270
Galena	71	210	584	1157	1798	2204	2760	2090	2271	1046	537	222	14950	14871
Gambell	622	573	727	929	1071	1401	2000	1818	1905	1438	1262	805	14551	15090
Juneau	322	274	456	801	1270	1099	1423	1218	1203	773	555	378	9772	8963
Kotzebue	198	303	652	1097	1524	2009	2528	2059	2218	1316	928	454	15286	16128
McGrath	135	235	557	1138	1842	2183	2544	1909	2082	950	519	284	14378	14379
Nome	385	404	613	946	1263	1720	2226	1656	1994	1171	765	474	13617	14249
Northway	205	259	589	1294	2380	2322	2874	2211	2135	977	564	329	16139	15407
St. Paul	606	508	613	795	927	1044	1262	985	1275	1107	873	646	10641	10977
Yakutat	369	328	517	771	1147	1069	1305	1145	1228	858	675	488	9900	9758
Umiat	276	446	891	1554	1651	2616	3178	2622	2842	1974	1773	1657	21480	18920
Wales	514	488	689	941	1181	1661	2276	2019	2108	1542	1104	756	15279	15923

Data from airport unless otherwise specified. CO indicates data from city office. * from cooperative stations.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Northern Comanche, southern Caddo, Grady and Canadian Counties, Okla.	1	3:30-4 p.m.					$30,000	$1,000	Winds	Windows blown in and buildings unroofed in vicinities of Elgin, Fletcher, Cyril, Minco, Verden, and El Reno. Several barns blown over in Minco area.
Osborne County, Kans.	1	4:30 p.m.					3,000		Electrical	Destroyed 4-room frame house and belongings 1 mile northwest of Covert.
Smith County, Kans.	1	Afternoon						1,000	Hail	Hail produced 25 to 75 percent crop loss to several fields south of Kensington and slightly less damage in an area northeast of city.
Morris, Ala.	1	P.m.			2				Electrical	A lightning bolt killed two persons as they sat under a tree.
Montgomery, Ala.	1	P.m.				1			Wind	Man blown from a ladder and slightly injured. Trees blown down on several streets, blocking one entirely.
Luverne, Ala.	1	P.m.			1				Electrical	Man and his dog killed when struck by lightning while man was repairing fence in pasture.
Brookwood, Ala.	1	P.m.			1				do	Farmer near Tuscaloosa struck by lightning and killed as he stood on front porch of his home.
Tuscaloosa, Ala.	1	P.m.					500		do	Bolt of lightning struck power line at Van de Graff Airport at Tuscaloosa, causing a small fire in roof of hangar; also caused two commercial airlines to bypass because of insufficient lights.
Sigel Township, Brown County, Minn.	1	P.m.						See remarks	Hail and electrical	Light to heavy hail, that accompanied a severe thunderstorm, caused much damage to corn and soybeans.
Wisconsin, southern portion	1	Afternoon					250,000	25,000	Electrical, wind, rain, and hail	Southward movement of squall line caused considerable property damage in southeastern Wisconsin. Rainfall excessive and winds of gale force in some sections. Many trees uprooted, electric power and telephone service disrupted, and buildings damaged by wind and fires started by lightning. At Randolph, a large seed company building burned with a loss of over $75,000. Several tobacco sheds and silos demolished near Oxfordville. At least 24 head of cattle killed by lightning; estimated value about $7,500. Underpasses and other low places in Milwaukee, Racine, and Kenosha flooded. Crops damaged by large hailstones.
Nebraska, southeastern portion	1	Afternoon and evening					Heavy	See remarks	Rains	Severe floods followed in Salt Creek and Blue River; much corn washed out.
Oregon, east of Cascades	1-11; 22-27	Afternoons		100					Winds and dust	Wind usually accompanied by considerable dust arising from summer fallow. Dust is very fine and will penetrate and filter through the minutest cracks in buildings and homes.
Shenandoah, Iowa	1	5:30-6 p.m.					10,000		Hail	Stones 1 inch in diameter common; some 2½ to 3 inches in diameter. Damage principally to glass.
Nodaway, Iowa	1	6:30 p.m.	1,760	3			See remarks		Wind	Six homes and approximately 12 other buildings damaged. Storm moved northeastward.
South Bend, Ind.	1	6:30 p.m.					800		Wind and electrical	Damage to trees, wires, and transformers.
Republic County, Kans.	1	Evening			0	0	1,000		Tornadoes and wind	Tornado moved from south of Formosa northeastward almost to Scandia, damaging several farms in its path. At least two other funnel clouds caused minor damage in area. High wind in Scandia tore up trees.
Grand Ledge, Mich.	1	Evening	8	½	0	0	°2,000	°	Tornado	Barn destroyed and parts of a field laid flat.
Lansing-Coldwater areas, Mich.	1	8:30 p.m.			1		°50,000	°	Winds	Severe squall line. Suburban and rural homes, barns, utility lines, and trees damaged by high winds. Death occurred from tree falling on car.
Marshalltown, Iowa	1	9:15-9:30 p.m.	880-1,760	1½	0	7	°600,000	°	Tornado and hail	Seven persons hospitalized, 4 houses demolished, 145 buildings damaged, and 1,000 trees destroyed or damaged. Storm crossed southern section of Marshalltown. Large hailstones also reported.
Ann Arbor-Ypsilanti areas, Mich.	1	9:20 p.m.	•20	30		1	°100,000	°	Wind and hail	Severe squall line. Wind averaged 60 m.p.h. for 5 minutes; highest gust noted 98 m.p.h. Some hail reported in scattered areas. High winds blew down

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										power and telephone lines, barns, trees, and television antenna.
Detroit, Mich.	1	9:49 p.m.			1		$50,000		Wind	Severe squall line. Winds reached 68 m.p.h. in gusts, blowing down trees in northwestern section. Acrobat killed when high pole snapped by wind.
Lander, Wyo.	1						35,000		Snow	Heaviest late snow on record. Telephone and electrical services disrupted. Trees and shrubs broken.
Erie County, Pa.	2	1:30–4 p.m.					See remarks		Electrical and wind	Severe windstorms hit Erie, Corry, and Union City, causing several thousand dollars damage to property and utility lines. Much lightning damage to utility lines, with some out over 24 hours. Winds ripped side of house away, blew small building from foundation, damaged trees, and blocked many roads with debris.
Farmington, Mo.	2	4:10–5 p.m.	1,320	10			8,000	$6,600	Hail	Holes knocked in roofs. Heavy damage to vegetables, corn, and fruit. Largest hailstones 2½ inches in diameter, with average 1 inch.
Clayton (2 miles north of), N. J.	2	P.m.			1				Electrical	Boy struck and killed by lightning.
Louisville, Ky.	2	9–9:30 p.m.			1		1,000		Wind	Gusts of wind up to 45 m.p.h. accompanied thunderstorm. Death caused by being struck by power line that was blown down. Property damage due mostly to strong winds. Utility services disrupted for a short period.
Bedford County, Va.	2	Evening					2,000	2,000	Electrical and wind	Near Bedford, in Forest-New London area, and at Goode, trees were uprooted, hay crops ruined, and porches and tin roofs torn off. At Norwood barn struck by lightning and burned down, including loss of 400 bales of new hay.
Fredericksville, Pa.	2						See remarks		Electrical	Lightning killed 2 cows and seriously injured a third cow while they were in pasture.
Cumberland, Dauphin, and Lebanon Counties, Pa.	3	2–8 p.m.					See remarks		Electrical, wind, and rain	Harrisburg man thrown across room when lightning struck his home, but he was uninjured. Power lines downed in several sections, with power out for as long as 3 hours. Lightning set fire to home in Cornwall, causing $2,000 damage. Fallen branches and muddy streets resulted in minor accidents and some property damage. Heavy rains flooded cellars in Mechanicsburg, and caused two street cave-ins in Carlisle.
Franklin-Oil City area, Pa.	3	Early afternoon					See remarks		Wind and rain	Severe windstorm uprooted trees, blowing some trees and limbs on homes and cars. Brick wall of factory blown out by wind. Power and telephone lines downed by wind-carried debris, with service out for 3 to 12 hours in various sections. Winds blew smokestacks into greenhouse, wrecked other chimneys, and ripped shingles from many roofs. Several highways blocked to traffic for 4 to 5 hours by trees, poles, wires, and other litter. Heavy rains caused much local erosion.
Ashe and Watauga Counties, N. C.	3	3 p.m.					2,000	13,000	Hail	Area of damage 100 square miles.
Columbia, S.C.	3	Afternoon			1		800		Wind and electrical	
Charleston, S. C.	3	Afternoon			2	3	500		do	
Smithsburg, Md.	3	P.m.						4,000	Hail	Hail damaged young fruit crops.
Indianapolis, Ind.	3	Afternoon			1				Electrical	Victim struck by lightning on open golf course.
Lynchburg, Va.	3	8 p.m.					See remarks		Electrical and wind	Knocked out power lines and Radio Station WLVA. Trees toppled in Rivermont area.
Bethesda, Md.	3	8–11 p.m.					40,000		Electrical and flash flooding	Lightning struck and set fire to a house, resulting in $20,000 loss. Flooding of buildings and basements and submersion of automobiles caused another $20,000 damage.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Forest, Va.	3	9:15 p.m.					$600		Electrical	Lightning struck feeder line into house, causing considerable damage by fire; six children rescued.
Pittsburgh, Pa.	3	Evening				8			do	Lightning struck the Moose Temple and knocked loose section of plaster which injured at least 3 persons. Three Pittsburgh residents injured when their homes were struck by lightning, and two persons injured when lightning shattered a mirror near them.
Corry, Pa.	3	Evening							Electrical and wind	Lightning burned out street light circuits in some sections. High winds overturned three cabins, damaged trees, and blew one tree into side and roof of home.
Martin County, N. C.	4	4 p.m.					10,000	$20,000	Hail	Area of damage 2 square miles.
Washington, D. C. and vicinity	4	5-8 p.m.					10,000		Electrical, rain and wind	Trees blown down. Basements flooded. A shed fired by lightning.
Baltimore, Md.	4	6 p.m.					1,000		Electrical	Lightning struck famous Westminster Presbyterian Church where Edgar Allen Poe is buried; bolt toppled a heavy concrete ball weighing about 900 pounds from the steeple. It fell through the roof, damaging some pews.
Washington, eastern Yakima County and areas to northeast and east	4-6								Rains	Heavy rains in eastern Washington, most marked in extreme southeast, did occasional but unestimated damage to dirt roads and irrigation canals, especially in eastern Yakima County. Cherry crops in lower Yakima Valley fruit districts damaged by splitting due to rains, causing considerable but as yet unestimated loss to the crop.
Eldorado (3 miles south of), Jackson County, Okla.	5	10:30-11:30 a.m.	•1½	5			3,000	60,000	Hail	About 75 percent damage to wheat and cotton.
Lake Arthur and vicinity, N. M.	5	2-3 p.m.			0	0	30,000	75,000	Hail and tornado	Tornado cloud reported over open range land.
Maljamar (south and west of), N. M.	5	4-5:30 p.m.					See remarks		Hail	No estimate of damage. A few hailstones size of large marbles.
Hardin, Mont.	5	4:50 p.m.	•2	5				25,000	do	Moved southeastward.
Wayne County, N. C.	5	5 p.m.							do	Damage of 75 percent over 8½ square miles.
Sanford, Fla.	5	5:30-6:30 p.m.	Narrow				Minor		Thunderstorm and wind	Number of limbs blown from trees. Storm moved eastward.
Branchville, S. C.	5	Afternoon					600		Electrical	
Sherman County, Kans.	5	6-6:30 p.m.	•1½-2	6			5,000	75,000	Hail	Severe hailstorm with stones size of golf balls moved from 2 miles north of Ruleton southeastward to 1½ miles east of Ruleton.
Cameron (south of), N. M.	5	9-10 p.m.	•2	5				See remarks	do	Almost complete loss of crops.
Logan County, Kans.	5	9:10-11:15 p.m.	•4	15			1,500	5,000	do	Severe hailstorm, with stones ranging from size of walnuts to golf balls, struck between McAllister and Winona, stripping trees and fields in its path. Hail piled to depth of 3 to 4 feet around buildings in small area.
Osborne County, Kans.	5	Evening					4,000		Electrical	Two-story home with contents of second story burned near Woodston after lightning strike.
Osborne County, Kans.	5	11 p.m.					3,000		do	Barn and contents including combine burned to ground about 5 miles north of Natoma.
Clay County, Kans.	5-6 (estimated)						1,000		do	Five head of cattle near Morganville found dead from lightning several days later.
North-central McLean, southeastern Ward, and southwestern	5-6	Night					See remarks	See remarks	Rain	Heavy washing and flooding rains up to 6 to 8 inches in about an hour, 7 miles southwest of Velva, caused damage to crops and flooded basements. As a result of heavy rains, floods developed which reached Velva on afternoon of 7th. Highway covered with

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
McHenry Counties, N. D.										18 to 20 inches of water.
Texhoma (north of), Texas County, Okla.	5		Narrow	Short	0	0	$1,000		Tornado	Tornado observed by driver of a truck who sought safety in road ditch. Truck was turned around. Steel granary carried ½ mile.
Garden County, Nebr.	5–10						5,000	$100,000	Hail	Series of hailstorms. Damage for each storm not available.
Cheyenne County, Nebr.	5–25						Slight	3,000,000	do	Hailstorms some place in County nearly every day, no estimates for separate storms available.
Karval (3 miles west of), Lincoln County, Colo.	6	12:30 p.m.	225	3–4	0	2	1,500	8,000	Tornado	Damage confined to one ranch, where a garage and granary demolished, a chicken house overturned, a water tank ripped loose, and a windmill uprooted. Injury to rancher and his family was in and around the eyes by blowing sand. Funnel visible for about an hour and traveled south-southeastward. Damage to crops caused by hail, following tornado, and resulted principally to wheat.
Hardin, Mont.	6	4 p.m.	•1	25				Considerable	Hail	Came from west. Hail pea size to ½ inch in diameter.
Grant County, Kans.	6	4:15 p.m.			0	3	See remarks		Tornado	Twister struck farm area east of Ulysses, injuring 2 persons in car blown off road and boy in home when window glass pierced his eye. Telephone and electric lines torn down.
Saline and Dickinson Counties, Kans.	6	5–6:30 p.m.						80,000	Hail and wind	Severe damage from hail occurred in several areas, including northwest of Salina, southeast of Salina, southwest of Abilene, and north and northeast of Elmo. High wind caused slight damage near Gypsum.
Trego County, Kans.	6	6 p.m.	400	3	0	0	40,000		Tornado	Tornado first dipped to ground 10 miles south and 2 miles west of Wakeeney, damaging three homes and out-buildings then skipped to 4 miles north and 2 miles east to damage another farm home.
Amarillo (5 miles northwest of), Tex.	6	6:20 p.m.			0	0	0	0	do	Funnel cloud observed about 5 miles northwest of Radio Station KGNC.
Borger (10 miles southwest of), Carson County, Tex.	6	6:50 p.m.		32	0	0	0	0	do	Two funnel clouds observed. First one never touched ground. Second one on ground about 4 minutes following 7:28 p.m.
Grant, Haskell, and Seward Counties, Kans.	6	7:30 p.m.		2	0	0	20,000		do	Tornado apparently originated near southeast corner of Grant County and moved eastward along Haskell-Seward County line, destroying a school building and causing extensive damage on four farms.
Pratt County, Kans.	6	7:30 p.m.	•6	34	0	0	30,000	15,000	Tornadoes and hail	Series of at least four twisters, in general storm moving northeastward, formed in Pratt area; damaged several rural homes in vicinities of Byers, Cullison, Coats, Pratt, and Preston. Some accounts state six funnels were observed near Pratt. Hail in several areas damaged crops. Crop damage by tornado, $5,000; hail, $10,000. Property damage by tornado, $20,000; hail, $10,000.
White Deer, Carson County, Tex.	6	8:06 p.m.	200	32	0	12	1,500,000	0	Tornado and hail	Three schools almost total loss; 38 homes completely destroyed and 40 homes partly destroyed; 9 autos completely wrecked. Storm moved southeastward. Believed to be same storm which started near Borger and observed near Pampa. Light hail.
Pampa (7 miles south of), Gray County, Tex.	6	8:40 p.m.		32	0	0	See remarks	0	Tornado	Twelve telephone poles downed on Pampa-Jericho highway.
Childress (3 miles northeast of), Childress County, Tex.	6	8:50 p.m.	880	2	0	0	Considerable	0	Tornado and hail	Four homes destroyed, two automobiles demolished, and six cows killed. Hail heavy in spots.
Osborne County, Kans.	6	Evening			0	0	See remarks		Tornado	Small tornado traveling northward demolished garage and broke trees in southern Natoma.
Pratt County, Kans.	6	Evening					750		Electrical	Barn on farm 1 mile east of Haviland burned to ground after being struck by lightning.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mangum (2 miles southeast of), Greer County, Okla.	6	9:30 p.m.	30	**300	0	0	$400		Tornado	Path northward. Farmstead damaged.
Butler County, Kans.	6	10 p.m.			0	0	3,000		do	Small tornado struck a farm in western Butler County 12 miles east of Wichita, demolishing barn and damaging several buildings.
Morris County, Kans.	6	Night					500		Electrical	Two cows killed by lightning near Council Grove during severe electrical storm.
Neosho County, Kans.	6	Night					3,500		do	Lightning caused fire northwest of Erie, which destroyed barn and contents, including combine and 160 bales of hay.
Jackson County, Okla.	6	Night					2,000	$20,000	Hail and wind	Two barns unroofed. Storm over eastern part of county. Wind damage $2,000; hail damage $20,000 to crops; included in total.
Stephens, Comanche, Grady, and McLain Counties, Okla.	6-7	11 p.m.-1 a.m.				1	10,000		Winds	High winds caused widespread damage to trees, signs, roofs, and windows in Rush Springs, Marlow, Pauls Valley, Duncan, Purcell, Lexington. Extensive damage to rural property in area.
Ada (near), Pontotoc County, Okla.	6	Night	Narrow	Short			15,000		Wind	Drive-in theatre north of Ada badly wrecked.
Wichita Falls, Tex.	6	11:50 p.m.	*9				1,000,000	Slight	Hail	Principal damage to roofs, autos, windows, and neon signs. Largest hailstones, about 5 inches in diameter.
Cox City, Grady County, Okla.	6-7	11:50 p.m.-12:45 a.m.	440	3	0	0	1,500	0	Tornado	One home destroyed; another moved; several roofs blown off. Nearly every building in Cox City suffered some damage.
Idaho, southwestern portion	6						Slight	Slight	Hail	Cooperative observers at Mesa, Parma and Three Creek reported hail, but indications are that it was not heavy.
Arkansas and Lonoke Counties, Ark.	7	7 a.m.	*1				5,500	2,000	Wind, rain, and hail	Storm moved eastward, causing extensive damage to trees, telephone and power lines, and roofs. In Stuttgart 75 percent of television antennas destroyed. Crop loss due to water damage to grains in storage.
Sanford, Fla.	7	3:30-4:45 p.m.	Narrow	**500	0	0	500		Wind (tornadic) and hail	This may have been small tornado. Shingles blown from roofs of three houses and other minor damage. No damage from hail as stones were small, 1/4 to ½ inch.
Manitou (near), Tillman County, Okla.	7	5 p.m.	100	½	0	0	6,000	0	Tornado	One farmstead damaged. Path southeastward.
Russell and Lincoln Counties, Kans.	7	5:30 p.m.	*6	25				12,000	Hail, wind, and rain	Hail accompanied by wind and heavy rain damaged wheat in northeastern Russell County, with slight damage extending into Lincoln County.
Oolagah, Rogers County, Okla.	7	6:15 p.m.	33	5	0	1	30,000	0	Tornado	Damage to five barns in area. Other damage to smaller buildings.
Guthrie and vicinity, Logan County, Okla.	7	7:15 p.m.	*2	6			10,500	15,000	Hail, wind, and electrical	Estimated $8,000 hail loss to greenhouses, roofs, and windows; $15,000 hail loss to wheat and gardens; $1,500 wind loss to baseball stadium; $1,000 damage by lightning to two houses; losses included in totals.
McLain, Muskogee County, Okla.	7	10:55 p.m.	Narrow	Short	0	1	See remarks		Tornado	One home demolished; nine houses damaged.
Tagus (near), Mountrail County, N.D.	7						See remarks		Electrical	Cow killed by lightning.
Red Boiling Springs, Tenn.	7						200		Wind	Tobacco barn blown down.
Clarksville, Johnson County, Ark.	8	1 a.m.	*5	20			150,000	51,000	Wind and electrical	Storm moved eastward, causing extensive damage to peaches, small grains, and corn. Several head of livestock killed by lightning. Several farm buildings destroyed and damaged. Telephone and power lines blown down.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Frontier County (eastern and northeastern portions), Nebr.	8	1:45 a.m.	•4–5	20			Slight	$100,000	Hail	Most damage to wheat.
Arkansas County, Ark.	8	4 a.m.					See remarks		Wind and hail	Storm moved southeastward causing considerable damage to telephone and power lines in Arkansas County and in city of Stuttgart. No estimate of monetary loss available. Some hail, but damage negligible.
Furnas and Red Willow Counties, Nebr.	8	5–7:30 a.m.	•2–8	50			$13,200	475,000	Hail	Most damage to wheat.
Phillips County, Kans.	8	7 a.m.	•6	25				800,000	Hail and wind	Hailstones size of walnuts driven by high wind caused extensive crop damage in area from 10 miles northwest of Phillipsburg to 12 miles southeast; heaviest damage east of town.
Madison County, Ala.	8	A.m.			0	2	5,000		Tornado	Home about 4 miles north of New Market leveled and two persons slightly injured. Granary destroyed, and other buildings damaged.
Sand Mountain, DeKalb County, Ala.	8	9 a.m.				2	2,500		Wind	Severe windstorm damaged 17 houses and 8 buildings, and completely destroyed 1 building; about 18 families affected.
Riley and Pottawatomie Counties, Kans.	8	11:45–12:15 p.m.					10,000		Hail, wind, and rain	High wind, accompanying heavy hail and rain, destroyed four light planes and caused minor damage at Manhattan Airport, while hail damaged crops in a path between Manhattan Airport and St. George.
Fulton County, Ga.	8	Noon			1	Several	15,000	Little	Electrical, wind, and rain	High winds blew down many trees, blocking traffic and causing traffic accidents. Power and communication lines blown down in many sections, putting more than 3,000 telephones out of commission and knocking out electrical services for a short time. Three 19,000-volt lines torn down by high winds in South Atlanta. High winds demolished a 10-car garage and damaged several cars contained therein; home moderately damaged. A number of large signs torn from their moorings, plate glass windows broken out, and numerous other minor miscellaneous damages. Lightning struck several homes, but damages light. Some low-lying sections of city flooded by heavy rains. Man killed when he came in contact with a "live" wire.
Lagrange, Wyo.	8	1 p.m.	•10	30			Moderate	Heavy	Hail	Heavy damage to growing crops. Roofs and buildings damaged.
Coffey County, Kans.	8	1:30 p.m.	600	3/4	0	0	See remarks		Tornado and wind	Tornado formed about 1 mile northwest of Waverly and traveled southeastward to town, dipping only once for a few seconds. High winds on surface broke trees and caused other minor damage.
Linn County, Kans.	8	2–4 p.m.	•10	25		1	40,000		Wind	High winds eastward through center of Linn County destroyed barns, unroofed houses, and damaged power and telephone lines.
Chester, S.C.	8	Afternoon					1,000		Electrical	
Florence and Pee Dee area, S. C.	8	Afternoon					25,000		Wind	Considerable damage by thunderstorm to buildings, communication and power lines, and trees, especially in Florence and Darlington areas.
Columbia and vicinity, S. C.	8	Afternoon			1		25,000		do	Thunderstorms caused heavy property loss and widespread interruption of communications and power. Loss of one life from electrocution by torn down "live" wire.
Appleton City, Mo.	8	3:40 p.m.					°10,000	°	do	Damage to phone and power lines totaled $7,000.
Ft. Laramie, Wyo.	8	4 p.m.	•4	10			Light	Heavy	Hail	Heavy damage to growing crops.
Douglas County, Kans.	8	5 p.m.			0	0	750		Tornado	Tornadic wind lifted roof and destroyed front and sides of barn at farm 8 miles southwest of Lawrence.
Bates County, Mo.	8	4–5:30 p.m.					°2,000	°	Wind	Crops blown over. A few barns and corn cribs destroyed completely. Building unroofed.
Maries County, Mo.	8	5:30–6:10 p.m.					6,000	1,000	do	Trees blown down. Gardens and crops suffered moderate damage.
Miller County, Mo.	8	5:30–7:30 p.m.					1,600	500	Wind and hail	Several barns and poultry houses destroyed. Hail averaged ½ inch in diameter, largest 1½ inch.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Clinton (9 miles south of), Washita County, Okla.	8	6 p.m.			1				Electrical	Farmer killed by lightning while operating a tracto
Corn and Colony, Washita County, Okla.	8	6:30-7 p.m.	100-1,320	15	0	0	$354,000		Tornado	No rain or hail accompanied tornado; moved east-southeastward. Seemingly struck from clear sky. Developed from clouds about 5,000 feet high. Two funnels converged just west of Corn, moved east-southeastward through town, and continued for a mil to east, then lifted some, coming down again at Colony, and continuing about 3 miles beyond. Ample warning allowed persons to take to caves or flee it path. The slowly moving tornado (less than 30 m.p.h. forward movement) was seen by many persons and was one of the most photographed tornadoes in Oklahoma. Observers reported seeing buildings lifted and crushed; 25 homes destroyed; 22 farm buildings destroyed; 80 homes and buildings damaged; 26 head of hogs and cattle killed; 1,650 chickens lost Objects carried as far as 90 miles from tornado path.
Dent County (northern half), Mo.	8	6:30 p.m.					See remarks		Wind	Falling trees near Salem blocked roads, broke power lines, and damaged roofs. A large barn demolished. Metal roofs blown off a mill and many small sheds. Damage estimated at thousands of dollars.
Cowley County, Kans.	8	6:30 p.m.	•5	9				$5,000	Hail	Hail in various parts of County, but greatest damage in areas north of Burden and near New Salem.
Osage County, Kans.	8	Evening					750		Electrical	Three cows killed on farm northwest of Osage City.
Neosho County, Kans.	8	Evening					1,500		do	Large barn and contents destroyed southeast of St. Paul.
Tonkawa, Kay County, Okla.	8	7:14 p.m.	200	1/4	0	0	7,500	0	Tornado	Damage to Airport hangar.
Chattanooga (west of), Okla.	8	7:15 p.m.	Narrow	Short	0	0	1,000	0	do	No rain. One farmstead demolished. Tornado cloud started toward ground about 300 yards west of the farmstead. Family took to cave. Tornado funnel observed by many; appeared as a silver ribbon out of sky as sun shone on it.
Tonkawa, Kay County, Okla.	8	7:25 p.m.	Narrow	Short			4,000		Wind	Damage to buildings and signs.
Stratton to Trenton, Nebr.	8	7:30 p.m.	•1	10			10,000	5,000	Hail	
Versailles (18 miles south of), Mo.	8						2,000		Wind	New car demolished by falling trees.
Camdenton, Mo.	8						See remarks		do	Extensive damage to timber and buildings.
Phelps County, Mo.	8						See remarks	See remarks	do	Severe damage in town of Rolla to gardens and trees.
Crawford County, Mo.	8								do	High school building in Steelville unroofed; 10 othe roofs damaged.
Goodwell, Texas County, Okla.	8				1	1			Electrical	Man working in hay field killed by lightning; another injured.
Brownsville, Tenn.	8						See remarks		Wind	Heavy damage to shade trees. Some residences damaged by falling trees and limbs.
Waynesboro, Tenn.	8						See remarks		do	Twelve to 15 houses unroofed. Shade trees ruined.
Arkansas and Lonoke Counties, Ark.	9	1 a.m.					See remarks		Wind, hail, and electrical	Storm moved southeastward, causing extensive damage to telephone and power lines. Telephone lines damaged when lightning struck cables at Jacksonville. Some hail, but damage slight.
Holly Bluff, Miss.	9	5:30 a.m.	10	2	0	0	2,000	Slight	Tornado	Tornado passed ½ mile northeast of station; 0.12 inch of rain. Roofs blown off; buildings turned over and collapsed. Described as oversized dust-whirl but "filled with black smoke".
Gaston, Lexington County, S. C.	9	2:30 p.m.			2				Wind	"Live" wire torn down previous day caused two fatalities.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ronceverte and vicinity, W.Va.	9	5-5:30 p.m.					$135,000		Rain	Flash floods undermined streets and roadbeds; sewer facilities disrupted; 36 commercial establishments and 7 residences flooded above first floor level; about 30 automobiles flooded.
Pioneer, Eastland County, Tex.	9	5:55 p.m.	•4	7			8,000	$10,000	Wind and hail	Fruit knocked off trees. Hailstones large as golf balls.
Coleman, Coleman County, Tex.	9	6 p.m.	•2	6			50,000		Hail	Hailstones as large as hens' eggs. Damage to roofs, windows, buildings, and trees.
Franklin County, N.C.	9	6 p.m.	30	4	0	0	°30,000	°	Tornado	Damage to buildings, autos, and crops.
Eastland, Eastland County, Tex.	9	7:15 p.m.	•4	4			°150,000	°	Hail	Stones as large as tennis balls. Heavy damage to roofs, glass, autos, and fruit trees.
Wichita, Scott, Lane, and Finney Counties, Kans.	9	11 p.m.-midnight					100,000	750,000	Hail and wind	Hail driven by high wind caused great losses over wide area, but most severe in two strips: (1) From 10 miles west of Leoti in Wichita County eastward across northern Scott County and southeastward into Lane County, passing just south of Healy. (2) Eastward across Finney County through Garden City. Damage to grain 100 percent over large sections and considerable damage to roofs and windows in Dighton and Garden City.
Harper County, Okla.	9		•2 to 4	30					Hail	Damage in area from northwest part of county to near Selman 10 to 100 percent.
Milan, Tenn.	9						See remarks		Electrical and hail	Damage to trees, buildings, and power lines.
Gray County (southern portion), and Meade County (northern portion), Kans.	10	1 a.m.	•8	16			28,000	80,000	Hail	Hail path eastward across Gray-Meade County border; damage to some fields of wheat up to 100 percent.
Greenwood community (northwest of Fargo), Ellis County, Okla.	10	4:30-5:30 a.m.	•6	16				150,000	do	Hail damage to wheat which was nearly ready for harvest.
Maysville and Norman areas, McClain and Cleveland Counties, Okla.	10	8:30 a.m.				1	6,000	20,000	Wind	Considerable damage to roofs, windows, etc.
Lubbock, Tex.	10	12:34 p.m.	1,760				Slight	Considerable	Hail	Hailstones 3 to 5 inches in diameter. Damage to cotton crop.
Rotan, Fisher County, Tex.	10	1 p.m.	440	3		2	50,000	50,000	Wind and hail	Hailstones as large as golf balls. Wind damage, $50,000; hail damage, $50,000.
Jacksonville Beach, Fla.	10	3 p.m.					2,000		do	Damage mostly due to wind. Two plate glass windows broken, one garage demolished, and canvas awnings torn.
Newellton, La.	10	Afternoon					1,500		Wind and rain	Farm buildings damaged. Rains ended prolonged drought.
Merkel, Taylor County, Tex.	10	3:50 p.m.	•5			6	°500	°	Wind and hail	Only light hail. Wind damage to buildings.
Abilene, Tex.	10	4:20 p.m.	•12				P1,500,000	°	do	Gusts to 120 m.p.h. observed at Abilene. Trees uprooted; houses and warehouses demolished or unroofed. One freight car derailed.
Sherman County, Kans.	10	6:30 p.m.	•4	12				75,000	do	Hailstorm originating near Colorado border moved to near Goodland, with heaviest damage 8 miles west of Goodland. Heavy wind accompanied hail.
Morton County, Kans.	10	8 p.m.						25,000	do	Hail and high wind damaged two farm homes and 800 to 1,000 acres of grain east of Elkhart.
Shreveport, La.	10						1,000		Wind	Damaged roofs and uprooted trees.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Block Island Sound, R.I.	10				13				Wind	Several days of strong easterly wind built up heavy seas which were a contributing factor to a disaster to a 35-foot fishing party boat, which hit a submerged object and sank suddenly in wind swept sea, with loss of 13 lives. Three other Connecticut craft disabled and one sunk in storm.
Colfax County (southern portion), N.M.	11-12							$130,000	Hail	Hail on 2 successive days damaged considerable acreage of wheat and row crops.
Clay County (southern portion), Kans.	11	2:30-4 p.m.			0	0	0	0	Tornadoes	At least four separate funnel clouds sighted within a 6-mile radius of Longford. Two northeast of town, one southeast, and somewhat later a fourth one south of town. None dipped to ground, and no damage resulted.
Ellis County, Kans.	11	3 p.m.		5	0	0	0	0	Tornado	Tornado formed 8 miles south and 20 miles west of Hays, but did not touch ground, although reported to have dipped earthward three times.
Graham County, Kans.	11	5:53 p.m.	Narrow	5	0	0	0	0	do	Tornado sighted about 60 miles northwest of Hill City CAA Station, moving northeastward; dissipated after 10 minutes.
Felt (vicinity of), Cimarron County, Okla.	11	6:09 p.m.	•1	3				2,000	Hail	Loss to wheat 25 percent.
Hugo (½ mile northwest of), Choctaw County, Okla.	11	6:52 p.m.	1,240	Short			$20,000		Wind	Damage to hangar and airplane. Also some damage to buildings in city.
Brady, McCulloch County, Tex.	11	7 p.m.						Slight	Wind and hail	Blew down trees; burned out two transformers in Brady.
Canyon, Randall County, Tex.	11	7:15 p.m.	•3				°100,000	°	Wind, hail, and electrical	Mostly hail damage. Hailstones as large as baseballs. Windows, roofs, and autos damaged. One house fired by lightning.
Quitaque, Briscoe County, Tex.	11	8:30 p.m.	1,760			3	6,000	10,000	Hail	Hailstones as large as baseballs. Automobiles, buildings, and crops damaged.
Turkey, Hall County, Tex.	11	9 p.m.					Considerable		Wind and hail	
Marshall County, Okla.	11	9-11:30 p.m.	•10	40			5,000	50,000	Hail	Small grain and cotton crops badly damaged in scattered parts of County, especially eastern and southwestern portions. Roofs and windows damaged by hail. Hail 1 to 3 inches in diameter.
Paducah, Cottle County, Tex.	11	10 p.m.	•3					Considerable	do	Estimated 15,000 acres of cotton to be replanted.
Labette County, Kans.	11	11 p.m.					1,500		Electrical	Barn and contents destroyed after being struck by lightning.
Ardmore area, Carter County, Okla.	11-12	11:50 p.m.-1 a.m.					800		Wind, rain, and hail	Damage to baseball park. One farmstead east of Ardmore damaged. Accompanied by rain and hail, causing minor damage.
Shreveport, La.	12	Early a.m.			0	0	50,000		Wind (tornadic)	May have been a tornado; heavy damage to roofs, car-ports, etc.
Wisconsin, central portion	12	Afternoon					20,000	15,000	Electrical and hail	Two homes damaged by lightning and fire at De Pere. Nine cows killed by lightning near Gillette. Heavy hail damaged crops near Seymour.
Hillsboro, Hill County, Tex.	12	6:30 p.m.					See remarks	Considerable	Wind and hail	About 1,000 acres of cotton ruined. Drive-in theater screen blown down.
Cartwright (near), Bryan County, Okla.	12	7:30 p.m.	•3	6				10,000	Hail	Damage to cotton, corn, and peanuts.
Doddridge and Harrison Counties (portions of), W. Va.	12-13	Night					9,000	10,000	Rain	Flash floods did considerable damage to growing crops, highways, and railroad beds. Several small towns flooded, with waters entering first floors in business districts at Salem.

See footnotes at end of table.

able 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
orks of Buffalo,Va.	13	Early a.m.				6	$2,500		Wind	Houses, automobiles, and rail of concrete highway bridge damaged. Telephone lines out for several hours.
ork Union, Va.	13	1:55-1:56 p.m.	200	2½			10,000	See remarks	do	Minor damage to crops. Tree fell on automobile. Garage blown into field. Tree fell on dwelling and tore roof badly. Roofs of other buildings blown off.
ipley to near Weeletha and Wetumka, Payne, Lincoln, and Okfuskee Counties, Okla.	13	2-4:30 p.m.	•2-10	70			50,000	$203,000	Hail	Crops completely destroyed over much of narrow belt extending southeastward over three counties. Small pigs near Stroud, Lincoln County, killed and covered with hail.
edgwick and Butler Counties, Kans.	13	3:30 p.m.					15,000	63,000	do	In Sedgwick County hailstorm originated northeast of Clearwater, moved northeastward to near Wichita, then apparently turned eastward and followed an eastward path across Butler County through Augusta. Neon signs, greenhouses, and automobiles suffered, and some Butler County farmers reported 20 to 30 percent damage. Damage estimated in totals are for Sedgwick County only.
ashington County, Md.	13	P.m.					See remarks	See remarks	Hail, wind, and rain	Trees and power poles and lines blown over. Roofs and buildings blown down. Fields and roads washed out by heavy rains. Hail considerably damaged fruit crops.
altimore, Md.	13	P.m.				1	800		Wind	One large plate glass window in a store front blown in. A tree blown on top of car, pinning driver in. Firemen worked ½ hour to free him; only slightly injured.
ichmond, Va.	13	4:05-4:15 p.m.	350	4	0	12	500,000		Tornado	Injured people discharged from hospitals within 2 days. Principal area of destruction 2 miles in length and for most part in low-cost housing section. Eight houses, 1 church, and 26 minor outbuildings destroyed; 120 buildings suffered major damage and 264 minor damage. In all 600 families suffered losses of some sort. Severe tree loss and damage in Monroe Park, Swan Lake, and Dogwood Dell sections of Byrd Park.
urf City, Pender County, N. C.	13	4:30 p.m.	20	1	0	0	10,000		do	Damage to buildings, and autos.
ubbock, Tex.	13	5 p.m.						Considerable	Hail	Complete cotton replanting necessary.
olumbus County,N.C.	13	5:30 p.m.					5,000	28,000	do	
ohnstown area, Pa.	13	Evening							Electrical	Rains of 1.5 inches earlier in day followed by 1 inch in 1 hour in evening caused flash flooding, which washed out retaining walls, undermined car tracks, eroded hillsides, gullied gardens and fields, washed out 2 small bridges, and blocked highways with silt and debris. Reported as worst flash flood of recent years and caused thousands of dollars property damage. Lightning hit and destroyed farm building and its 700 bushels of wheat near Ebensburg.
olbert (near), Bryan County, Okla.	13	8:30-9:30 p.m.	•3				450	1,500	Hail	Area in radius of 7 or 8 miles in Colbert.
ranklin County,N.C.	13	9 p.m.	1,000	2			5,000	80,000	do	
ismarck (15 miles east of), N. D.	14	11:30 a.m.			0	0	0	0	Tornado	Funnel first noticed about 11:30 a.m. by pilot. It was clearly visible from airport, and appeared to reach about half way to ground as far as could be seen. Pilot also believed it did not reach ground, although rain showers obscured it at times. Cloud appeared to dissipate about 11:50 a.m. Funnel observed by several people in different parts of county.
ranklin, Nash, Caswell, Person, Wake, and Wilson Counties, N. C.	14	3-5 p.m.					20,000	1,000,000	Hail	Area of damage 200 square miles.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Lincoln (east and southeast of), Nebr.	14	4-6 p.m.	•5	8			$400,000	Some	Rain	From 4 to 7 inches of rain fell over upper Antelope Creek basin, causing severe flash flood; many basements and a number of ground floors flooded; much damage to stores and factories.
Crowley County (southwestern portion) and Otero County (northern portion), Colo.	14	4-7 p.m.	•20	40			500,000	$500,000	Hail and rain	Hail ranged in size from 3/8 to 1½ inches. Local flooding, particularly in Rocky Ford, caused more damage than hail. Storm traveled southeastward.
Purdum (near), Nebr.	14	7-9 p.m.	•10	10			5,000	15,000	Hail and wind	
Thedford (near), Nebr.	14	8 p.m.	•3	6				10,000	Hail	
Hooker (near) Texas County, Okla.	14	7:35-8:05 p.m.	•3	4			10,000	40,000	do	Damage to wheat.
El Paso County (northeastern portion), Colo.	14	Evening			0	0	3,000		Tornado	Two barns, chicken house, garage, granary, and automobile demolished.
Apache (near), Caddo County, Okla.	15	1:30-2:30 a.m.	•5-6				500		Wind	Straight winds from west. Damage to community building; also to large hay barn 1½ miles northwest of Apache. Windows broken.
Oklahoma City (northwestern portion) Okla.	15	3 a.m.	Narrow	Short			1,500		do	Practically all damage confined to a small area around 1100 N. W., 40th St.
Lynn County, Kans.	15	4 a.m.	•2	8			1,000	10,000	Hail	Several areas in Lyon County received hail; greatest damage in strip between Long and Reading, where crops riddled and metal roofs dented. Hail piled into foot-deep drifts.
Ridgefield and vicinity, N. J.	15	P.m.	•1					23,000	Wind and hail	Hazardous driving conditions during storm. Hail about 3/8 inch in diameter fell for 15 minutes, damaging crops.
Douglas County, Kans.	15	5:30 p.m.	880	2			300	2,000	Hail	Hail in small strip 3/4 mile northwest of Newman damaged roofs, wheat, and young corn.
Colorado City, Mitchell County, Tex.	15	6:40 p.m.	•10				See remarks		Wind and hail	Heavy hail damage to houses, cars, and neon signs.
Merkel, Taylor County, Tex.	15	10:20 p.m.	•3	5	0	6	180,000	0	Tornado	Damage to buildings.
Shawnee County, Kans.	15	7:15 p.m.	100	½	0	0	25	600	Hail and tornado	Distinct funnel cloud observed 3½ miles southeast of Silver Lake, moving east-northeastward within area of hail. It tore chimney from house, destroyed trees, and pulled vegetables from ground. Crop damage, $25 by tornado.
Anderson County, Kans.	15	Evening					500		Electrical	Horse killed by lightning.
Bourbon County, Kans.	15 (estimated)						1,800		do	Twelve cattle found dead week after being struck by lightning on farm southwest of Ft. Scott.
Joshua, Johnson County, Tex.	16	12:30 a.m.	•5	15	0	0	°12,000	°	Tornado and hail	Heavy damage to homes, barns, and garages. Storm moved eastward. Light hail; small crop damage.
West Columbia, S. C.	16	Afternoon			1				Electrical	Man killed by lightning.
Dodson, Mont.	16	7 p.m.	•8	10				Slight	Hail	Damage to wheat.
Bladen County, N. C.	16							65,000	do	Area of damage 15 square miles.
New Orleans, La.	17	Early a.m.					5,000		Wind	Damage at Lincoln Beach area on Lake Pontchartrain.
Chase County (western portion), Nebr.	17	6 a.m.	•6	10			1,700	120,000	Hail and wind	Slight wind damage.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Delphia, Mont.	17	1:30–2 p.m.	•5–6	70				Severe	Hail	Hailstones from size of marbles to pullet eggs. Storm extended as far south as Hysham.
Northville, N. Y.	17	1:45 p.m.					See remarks	See remarks	Hail and rain	Heavy rain and hail confined to area of Northville. Hailstones, about 1 inch in diameter, piled to a 4-inch depth in places. Nearly all gardens, planted fields, and vines severely damaged. Streets littered with tree leaves. Streets flooded and two deep washouts reported.
Danvers, Mont.	17	2:30 p.m.	•1½	15				Severe	Hail	Damage to winter wheat. This same storm reported at Kolin, Ware, and Hanover.
Ulm, Mont.	17	3 p.m.	•2–3	20				Considerable	do	Hailstones 1/4 to 1/2 inch.
Sherman, Cheyenne, and Rawlins Counties, Kans.	17	Afternoon					See remarks		do	Heavy hail damage at several farms along Cheyenne-Sherman County border, further north in Cheyenne County, and in western Rawlins County.
Hamilton County, Kans.	17	Afternoon			0	0	See remarks		Tornadoes	One of four funnels sighted in area dipped to a farm northwest of Syracuse, damaging house and several out-buildings.
Boston area, Bristol County, Mass.	17	3 to 5 p.m.							Wind and rain	Scores of trees downed in Greater Boston and neighboring communities of Chelsea, Everett, Melrose, Medford, and Wakefield; wires broken and 2,000 homes without electricity for 4 hours.
Somerset, Mass.	17	4 to 5:30 p.m.					$20,000		Electrical	Lightning set fire to dairy, burning part of plant and equipment.
Carter-Ft. Benton, Mont.	17	4:30 p.m.	•3	100				Severe	Hail	Hailstones size of marbles and larger. Damage mostly to wheat.
Rhode Island, northern half	17	5:20 to 7 p.m.					1,000		Electrical, rain, and wind	Flooded highways, fallen trees, power failures, and lightning caused considerable scattered damage.
Coffee Creek, Mont.	17	6 p.m.	•1½	6				$15,000	Hail	Two storms, one on each side of Coffee Creek.
Monona and Woodbury Counties, Iowa	17	6:30–10:10 p.m.					See remarks	100,000	Wind, rain, and hail	Storm affected northern three-fourths of Monona and southern one-third of Woodbury Counties. Three barns and other buildings damaged by wind, but principal loss from flood waters and silt over bottomlands. Hail mostly ½ inch in diameter, but some size of golf balls.
Lynch (near), Nebr.	17	8–11 p.m.	•1–2½	8–10			2,300	20,000	Hail and rain	
Gove County, Kans.	17	10 p.m.			0	0	See remarks		Tornadoes	Damage from tornadoes occurred first in southeastern Quinter, then 1 mile south of Quinter, and a little later several miles west. Probably three separate funnel clouds formed since damage appeared to have occurred from east to west.
Dupuyer, Mont.	17		•2–5	65				Considerable	Hail	Damage mostly to barley and wheat. Storm began in southern Glacier County and extended into Pondera County to south of Valier.
Dutton, Mont.	17		•8	50				1,000,000	do	Hail varied in size from peas to small eggs. Damage mostly to winter wheat.
Comanche and Stephens Counties, Okla.	18	3:30–5 a.m.	•25			31	1,755,000	100,000	Wind and hail	Thirty persons injured in Ft. Sill area. High wind estimated at 100 m.p.h. damaged tents, planes, buildings, and other property at Ft. Sill to extent of $1,500,000. One person injured in Lawton. Wind damage $250,000 in Lawton area. County Agent reported crop damage very severe, and hundreds of houses, barns, poultry houses, and small buildings completely destroyed to slightly damaged.
Niobrara and Weston Counties, Wyo.	18	Afternoon					30,000	10,000	Hail	Severe damage to buildings and automobiles. Livestock killed, and crops damaged.
Danvers, Mont.	18	4 p.m.	•1	10				10,000	do	Damage to winter wheat. Storm on 17th damaged this same area.
Yates and vicinity, N. M.	18	4–5 p.m.					500	1,000	do	Property damage confined to cars, windows, and roofs.
Portales and vicinity, N. M.	18	5–6 p.m.					75,000	200,000	do	Severe damage to row crops, wheat, and alfalfa.

See footnotes at end of table.

Table 4--Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Sugar City-Cheraw areas, Colo.	18	5-6:30 p.m.	•3	30	0	0	$10,000	$100,000	Hail and tornado	Hail ranged in size from 1/4 to 1-1/4 inches in di meter. At least one tornado sighted which damage outbuildings on one ranch.
Kaycee, Wyo.	18	6 p.m.					240	Light	Hail	Principal damage to roofs and windows.
Allen County, Kans.	18	6 p.m.	•2	3			4,000	10,000	Wind, hail, and rain	High wind accompanying hail and heavy rain beat do corn, oats, and wheat, uprooted trees, and impair telephone and electric services from east of Iola to Moran.
Allen County, Kans.	18	6:15 p.m.					3,000		Electrical	Fourteen head of beef cattle killed by lightning 4 miles north of Moran.
Roundup, Mont.	18	9 p.m.	•2	20				Considerable	Hail	Two thousand acres of wheat damaged.
Lake View, Iowa	18	10:30 p.m.	100	1½			°5,000	°	Wind	Damage to garage, 2 busses, and trees at Lake View Court.
Collins, Mont.	18							Slight	Hail	Only a small area northwest of Collins.
Worcester County (southern portion), Mass.	18								do	In Sturbridge, hail fell in a brief violent storm, strictly local, breaking some 40 windows in Old Sturbridge Village alone and many others in manufacturing plants in Fiskdale area.
Mobile area, Ala.	18							See remarks	do	Some crops, which had escaped or partly escaped drouth damage, were flattened by huge hailstones.
Cherry County (north-central and northeastern portions), Nebr.	19	2:45 a.m.	•6	15			200,000	Slight	Hail and wind	Severe glass breakage, roof damage, and damage to automobiles.
Browns Lake, Iowa	19	12:10 p.m.		3		2	20,000	5,000	do	Six cottages, boat buildings, and one farmstead dam aged. Loss $20,000 to buildings; $5,000 to crops, mainly from hail.
Kings, Tulare, Fresno, and Madera Counties, Calif.	19	2:10-7 p.m.					27,300	1,500	Electrical	Fires were started in grain fields and in at least two residences; over 25 power distribution transformers burned out; 13 brush fires started in land protected by California State Division of Forestry several fires in mountain forests in Sierra Nevada Heaviest storms in vicinity of Fresno.
Allison Township, Lyon County, Iowa	19	4-4:10 p.m.	17	½	0	0	°10,000	°	Tornado	Damage to barns, granaries, corn cribs, and trees. Funnel cloud observed.
Elliott-Morton Mills, Iowa	19	4:45-5:45 p.m.		11		1	°50,000	°	Wind and hail	Barn and house severely damaged; minor damage to nu erous other buildings, including extensive breakag of glass by hail; electric service disrupted.
Harrison (18 miles north of), Nebr.	19	4:30-5 p.m.	110	5	0	1	2,500	1,000	Tornado	
McCallsburg-Cedar Rapids, Iowa	19	4:45-6:30 p.m.	•3-12	90	1	3	500,000	1,750,000	Wind and hail	Extensive damage from hail, with hailstones mostly inch in diameter, but occasionally size of golf balls. One death from over exertion in storm. On man severely burned by electric line. Woman and child hospitalized after being bruised by hailston Considerable damage to farm buildings; minor damag caused by falling trees all along track of storm. Hail damage mainly to growing crops, but much glas broken in towns. Towns reporting considerable damage were: McCallsburg, St. Anthony, Clemons, Garwi Toledo, Tama, Vining, Elberon, Keystone. Damage i Belle Plaine and Cedar Rapids, mainly to public utility lines.
Bloomfield, Mont.	19	5:30 p.m.	1,320	3½				Considerable	Hail	Damage mostly to winter wheat.
McLeod, Hennepin, and Anoka Counties, Minn.	19	5:30-7:45 p.m.	330	56	1	See remarks	1,150,000	See remarks	Tornadoes, rain, and hail	Icehouse, warehouse, houses, barns, and outbuilding demolished; about 50 city dwellings, buildings, an street carnival concessions damaged; plate glass windows blown in; chimneys toppled; windows broken; billboards and signs downed; automobiles wrecked o damaged; power and communication lines downed; hundreds of trees uprooted; a number of personal injuries; growing crops damaged. Path of storm not continuous; moved northeastward. Heavy rains and hail accompanied storms. First tornado struck Hutchinson, McLeod County, about 5:30 p.m. Second

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										tornado (possibly a continuation), struck Plymouth Township, Hennepin County, about an hour later and last observed near Anoka, Anoka County, shortly after 7 p.m. Third tornado reported about 7:45 p.m., a few miles east of St. Paul, but partially developed funnel-cloud did not descend to earth.
Northern Cloud, southern Washington, and central Marshall Counties, Kans.	19	6-7 p.m.					See remarks		Hail	Variable damage occurred from heavy hail in several areas from south of Jamestown in Cloud County, northeastward through Linn and Palmer in Republic County, into central Marshall County near Marysville and Frankfort.
Clark County, Kans.	19	6-7 p.m.	12	12	0	0	$2,500	$55,000	Tornado, hail, and wind	Hail and high wind originating about 6 miles north of Ashland, swept southward over a 12 mile wide strip with Ashland at center and continued from 2 to 6 miles southward. Wind flattened nearly ripe wheat, and hail caused extensive damage to crops and light damage to property. Tornado sighted 15 miles northeast of Ashland just before hail storm; did not drop to earth. Crop damage by wind, $10,000; by hail, $45,000.
Wisconsin, central portion	19	7:30 p.m.	•3	15			10,000	30,000	Hail	Large hail damaged many roof tops, broke many windows, and damaged crops in Waushara and Waupaca Counties. Some stones reported as 5 inches in diameter. Hail damage also in Dodge and Columbia Counties.
Brownsville, Wis.	19	8:30 p.m.	500	1	0	0	25,000	0	Tornado (probable)	Large barn demolished and contents scattered over wide area. Two large beams from barn driven through walls of farm house. Large trees snapped like match sticks.
Jefferson County, Kans.	19	8:30 p.m.					See remarks		Wind	High wind with some tornadic characteristics tore roofs from barns, lifted a steel granary, and uprooted trees in McLouth and broke power lines there and also in Oskaloosa and Valley Falls. Destructive winds of less serious nature also occurred that evening in Jackson, Atchison, and Wyandotte Counties.
Ellis County, Okla.	19	10 p.m.							Hail and wind	Hail reported as much as a foot deep. Wind damage to church at Arnett $1,500.
Barber County, Kans.	19	Night					500		Electrical	Lightning caused fire which destroyed portion of a shed and hay contained therein, in southern Barber County 6 miles west of Hardtner.
Franklin County, Kans.	19	11 p.m.			0	0	1,000	See remarks	Tornado and hail	Small twister, followed by hail, damaged farm home, uprooted trees, and flattened 20 acres of corn and garden at farm 10 miles east of Ottawa. Damage was by tornado.
Comanche County, Kans.	20	Late afternoon			0	0	5,000	Heavy	do	Hail occurred at scattered points over County; heaviest damage north of Coldwater, where hailstones more than 3 inches in diameter fell, and southeast of Coldwater. About 17 miles southeast of Coldwater tornado struck a farm, tearing down new granary and a barn and damaging a car and truck. Tornado struck later across State line in Oklahoma. Damage by tornado, $5,000.
Crowley County (southern portion), Colo.	20	6-7 p.m.	•1½	8-10	0	0	°20,000	°	do	Storm, traveling northeastward, caused damage in Crowley, Sugar City, and Ordway. In Sugar City area, a small tornado reported but no funnel seen. Blowing over of trees and outbuildings and unroofing of barns would indicate gusty winds rather than tornado. Hail ranged in size from 1/4 to 1-1/4 inches.
Gruver, Hansford County, Tex.	20	6-8 p.m.							Hail	Heavy hail from Griggs, Okla., southeastward to Gruver, Tex.
Terry, Mont.	20	Evening	•2	5-6				Slight	do	Hailstones 1/4 inch in diameter. Damage to wheat.
McPherson County, Kans.	20	7:30 p.m.	880	30				Severe	do	Hail damaged wheat and other crops up to 100 percent and broke windows in its path from the Rice-McPherson County line south of Windom eastward across McPherson County and into edge of Marion County. Hardest hit was area south of Elyria.
Wichita, Scott, and Lane Counties, Kans.	20	9:30-10:30 p.m.		50	0	0	30,000		Tornado	Tornado moving east-northeastward struck three times in three counties at 30-minute intervals: (1) Just south of Leoti in Wichita County in strip 1 mile wide from north to south; tornado snapped off electric poles, destroyed a steel granary, and flattened gardens. (2) South of Scott City at least five farms felt effects of tornado, with large barn demolished,

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										corrals blown over, and shingles torn from house. In and near Dighton, Lane County, heaviest damage resulted, including roof of American Legion Hall, church, grandstand at fairgrounds, and planes at airport. Severe winds across County also damaged farm buildings.
Alfalfa County, Okla.	20-21	9:30-1 a.m.					$50,000	$500,000	Winds and hail	Covered entire County and adjoining areas. Hail da age to wheat, oats, and row crops estimated at $400,000, included in total. High wind damage to crops $100,000; to property $50,000; included in total. There may have been one or more tornadoes within high wind area but no definite tornado path of damage noted.
Osborne County, Kans.	20	11:15 p.m.					5,000		Electrical	Rural schoolhouse near Natoma burned to ground afte being struck by lightning.
Meno (south of) to Isabella and to Ames, Major County, Okla.	20	11:20 p.m.	Narrow	Short	0	0	75,000	0	Tornado	A number of barns, granaries, and other buildings damaged.
Waynoka to Daycoma, Woods County, Okla.	20-21	11:20 p.m. -2:30 a.m.					3,000	3,000	Wind and hail	Hail damage to crops. Wind damage to automobiles and roofs of buildings.
Hennessey (near), Kingfisher County, Okla.	20-21	11:30 p.m. -12:15 a.m.	*16	16			50,000		Wind	Extensive damage to property in area. Wind estimated at 80 m.p.h.
Pawnee County, Kans.	20	11:55 p.m.					2,000		Electrical	Fire produced by lightning destroyed a large barn and milking machine, hay, and feed on farm 10 mile south of Larned.
Tulsa, Okla.	20-21	Midnight-8 a.m.					7,000		Wind and electrical	Considerable telephone cable and power transformer damage; about 90 percent electrical.
Johnson City, Tenn.	20						See remarks		Wind	Extensive damage to power and telephone lines.
Sumner County, Kans.	21	2 a.m.				2	1,750		Wind and rain	Strong winds accompanying heavy rain blew over an o derrick onto a shack, injuring 2 occupants; also blew over a large granary and shattered a plate glass window. Reports of a swishing sound suggest the probability of a tornado above the surface.
Saline County, Kans.	21	3 a.m.					75,000		Electrical	Fire caused by lightning destroyed a 2-story frame building and contents.
Brown County, (southeastern portion), Kans.	21	Early a.m.					700		do	Barn full of hay burned to ground near Everett afte being struck.
Wilson County, Kans.	21	5:30 a.m.					4,000		do	Bolt of lightning caused extensive damage to home i Fredonia, when it ripped out electric wiring, melted water pipes and telephone wires, and destroyed closet.
Pine Bluffs, Wyo.	21	Afternoon	*4	15			5,500	100,000	Hail	Principal damage to growing crops. Some poultry killed. Glass broken in automobiles and buildings
Felt (near), Cimarron County, Okla.	21	Late afternoon	Narrow	Short	0	0	5,000	0	Tornado	Tornado quite small. First grounded 5 miles due north of Felt where it destroyed granary; swung we about ½ mile, then reversed and lifted after retur ing almost to point of original contact. Traveled in air northeastward and touched ground again abou 7 miles north and 4 miles east of Felt, where it destroyed 2 granaries and 1 barn before dissipatin
Cimarron and Texas Counties, Okla.	21	4-6 p.m.	*4	50			300,000	100,000	Hail	Thousands of acres of wheat damaged 20 to 80 percen from Wheeless to Griggs. Extensive damage to buil ing roofs and automobiles. Some livestock killed.
Arthur County, Nebr.	21	4-5 p.m.	*5	6-7				See remarks	do	Most damage to crops, probably several thousand dollars.
McPherson County, Kans.	21	Evening						See remarks	do	Severe losses from hail southwest of Inman, ranging upward to 100 percent crop damage.
Pulaski and Fulton Counties, Ind.	21	7:50 p.m.	*4	8	0	4	750,000	50,000	Tornado, rain, and wind	Storm moved eastward. Destroyed 14 barns; damaged houses, automobiles, and trees; killed livestock and poultry.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Yuma County (extreme southwestern portion), Colo.	21	8:40 to 9 p.m.	•12	20			See remarks		Hail and thunderstorm	Three separate hailstorms moved southeastward, one following the other. The first occurred about 2:30 p.m., the second about 5 p.m., and the third and worst at 8:40 p.m. Hail ranged in size from marbles to baseballs, and was 8 to 12 inches deep over the area; still visible on ground on June 24. Large numbers of wild fowl killed. Cattle bruised and bleeding. One rancher reported loss of 1,000 turkeys. Storm reported to be worst ever known in that region.
Kansas, northwestern portion	21-22	10 p.m.-3 a.m.		250	0	0	$526,000	$5,315,000	Hail, wind, rain and tornadoes	Probably the most extensive storm of the month, with heavy hail, high wind, excessive rainfall, and evidence of at least five small tornadoes. It originated near the Colorado border west-northwest of Goodland about 10 p.m. of 21st and moved southeastward in path from 2 to 5 counties in width as far as Rice and Reno Counties by 3 a.m. of 22d. Two paths of extremely heavy damages appear to have formed within the general storm area, which embraced northwestern quarter of Kansas: (1) From Colorado border in Sherman County through Goodland, with heavy damage to wheat from hail and wind; through Thomas and Logan Counties, with greatest destruction in center of path through Oakley and a small tornado at Mingo; on through Gove County, becoming particularly destructive through Trego and Ness Counties; continued into Rush, Pawnee and Stafford Counties at about 3 a.m., and with diminished severity into Rice and Reno Counties. Winds up to 90 m.p.h. drove the hail with great force. Near LaCrosse, in Rush County, small tornado destroyed buildings on at least one farm. (2) Shortly after midnight heavy hail began in southern Norton County (at the same time it was occurring in Gove County to the south) and moved southeastward through southwestern corner of Phillips County, across northern Rooks County, where it is described as the "County's worst hailstorm". Three small tornadoes reported across Osborne County between Alton and Covert and into Mitchell County. Crop damage listed for the storm was from hail. Property damage: $401,000 by hail, $120,000 by wind, $5,000 by tornado. Estimates for only portion of area involved in storm.
Kansas, southeastern portion	21-22	11:30 p.m.-1:45 a.m.					360,000	10,000	Wind	Path of movement was indefinite but towns along southern borders of Montgomery, Labette, and Cherokee Counties apparently hit first at about 11:30 p.m. on 21st, then areas in northern part of those counties and southern Wilson and Neosho Counties shortly after midnight, and an hour later in eastern Crawford County. Winds of 80 to 100 m.p.h. occurred in Coffeeville and damages indicate similar speeds in Independence, Parsons, and Oswego areas. Roofs, small buildings, trees, and power lines damaged extensively. In Coffeyville a radio tower twisted and blown over, indicating possibility of a tornado above the surface.
Pine Creek Flats, Lassen County, Calif.	21								Hail and rain	Heavy hail and rain lasted about 2 hours; estimated that 2 to 3 inches of rain occurred during the period.
Montgomery County, Kans.	21	Near midnight					1,500		Electrical	Barn filled with hay destroyed by fire 3-1/4 miles west of Cherryvale after being struck by lightning.
Greenwood County, Kans.	22	Early a.m.			0	0	500		Tornado	Small tornado dipped near Eureka, causing minor damage at two farm homes, blowing away one barn and tearing apart trees.
Paris, Tenn.	22	Afternoon					See remarks		Wind, rain, and electrical	Severe wind, rain, and electrical storm battered Paris for more than an hour. Four inches of rain fell. Roof blown from church. Wind also uprooted two dozen trees and knocked out power, telephone, and telegraph services.
Clarksville, Erin, and Cumberland City, Tenn.	22	Afternoon					See remarks		Wind and rain	Many small buildings damaged. Trees uprooted; scattered interruption in power and telephone services.
Parkersburg and vicinity, W. Va.	22	Afternoon					1,600	0	Wind and electrical	Many trees blown down; several parked cars damaged by falling trees; concrete block barn torn down by high winds; electric power services disrupted. Several buildings damaged by lightning.
Nashville, Tenn.	22	3 p.m.				2	See remarks	See remarks	Wind and rain	Wind reached 57 m.p.h., and 0.73 inch of rain fell in 6 minutes. Electrical services disrupted; considerable crop damage, and considerable damage to trees in residential areas.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Carthage, Tenn.	22	4-6:30 p.m.					See remarks		Winds	Trees blown down. Some damage to power lines and roofs.
Cleveland, Ohio	22	5 p.m.	100	3	0	0	$500,000		Tornado, winds, and rain	During passage of severe thunderstorm, several persons saw funnel cloud passing from a point about miles northeast of Cleveland W.B.A.S. along a 3 mile path before it dissipated. Funnel tip touch ground near W. 130th St. and Bellaire Road where large chemical plant wrecked, several garages demolished, several homes damaged, and power lines and trees shattered.
Scottsville, Va.	22	Late afternoon					250	$1,000	Rain and wind	Much damage by heavy rain to gardens, and much cor blown down. Mink Creek flooded streets in busine section and covered floor of one business house.
Red Boiling Springs, Tenn.	22						See remarks		Electrical	Most severe electrical storm of year; considerable damage, including loss of a stock barn.
Point Pleasant area, W. Va.	23	Early a.m.					3,000	See remarks	Wind and rain	High winds destroyed barn near Hogsett. Telephone lines and cables damaged by wind and rain disrupting service temporarily. Heavy damage to crops i Crab Creek area from wind, rain, and light hail.
Kansas, southeastern and east-central portions	23	5:30-9:30 a.m.		200			12,750,000	1,590,000	Hail, wind, and rain	Strong winds accompanied by hail in many sections, lashed a large area from Kingman and Sumner Counties northeastward through Sedgwick, Cowley, and Butler Counties into Missouri; path often three or more counties in width. Heaviest hit by hail were (1) Wichita and vicinity, where automobiles, windows, and roofs damaged in city and crops suffered in Cheney area. (2) Butler County from southwest o Augusta across County to northeast of ElDorado, where storm the most severe in years. Hailstones piled a foot deep southeast of ElDorado and caused extensive damage to buildings and crops. (3) South ern Greenwood County through Eureka and Climax to Fall River, where roofs, neon signs, and automobil received damage as well as all crops in area. (4) Savonburg-Elsmore area of Allen County. Damaging winds and heavy rain throughout east-central part of State, with lesser hail damage at many points. Damage estimated for Sedgwick and Butler Counties only.
Graham County, Kans.	23	6:51 a.m.			0	0	0	0	Tornado	Tornado cloud plainly viewed by Hill City CAA perso nel about 20 miles southeast of Hill City. Did no touch ground.
Beaver County (northern part); also Harper and Woodward Counties, Okla.	23-24	10-10:30 a.m.; 8:20 p.m. -1 a.m.	*3-4	60			222,000	426,000	Hail and wind	Two paths each 3 to 4 miles wide extended southeast ward across Beaver and Harper Counties; in part of Harper path 10 to 12 miles wide. Damage to wheat, alfalfa, sorghums, and row crops. Hail larger tha baseballs at Laverne. Heavy damage to auto and window glass. Grain elevator damaged heavily. Som livestock killed. Wind damage to property $30,000 included in totals.
Pittston, Pa.	23	Afternoon					See remarks		Rain	Heavy rains sent local creeks over their banks, flooded stores and homes, and caused some landslid which blocked highways.
Chambersburg, Pa.	23	Afternoon				1			Wind	Woman injured when tree fell on auto in which she w riding. Power lines felled by wind-born branches.
Harrisburg area, Pa.	23	3-6 p.m.				1			Electrical and rain	Near Rockville, lightning struck near a boy seated a tractor and knocked him to the ground, ripping o his shoes. Lightning struck and damaged chimney i Harrisburg. Traffic jammed in several places wher rains suddenly inundated highways.
Buncombe County, N.C.	23	6 p.m.				2			Electrical	Injuries occurred in vicinity of Asheville.
Morton and Stevens Counties, Kans.	23	6 p.m. and 10 p.m.	*5	22	1	5	100,000	30,000	Tornado, wind, and hail	Two storms in same area: (1) Hail with strong wind 6:30 p.m. in Rolla and Wilburton vicinities in Morton County, with hailstones 3 to 4 inches in diame er. (2) Tornado at 10 p.m. struck at Rolla, breaki all windows on north sides of 2 churches, destroyi roof of home, large grain bin, and small houses, f tally injuring an occupant. Another tornado struc nearly an hour later at Hugoton Airport in Stevens County, destroying three hangars. An injury occur near Rolla when man's arm was broken by large hailstone. Four other persons received minor injuries. Property damage by tornado, $50,000; by hail, $25,000; by winds, $25,000. Crop damage by hail, $30,000.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kansas, southeastern portion	24	12:20-3 a.m.				2	$55,000	$66,000	Wind and hail	High winds beginning in Cowley County moved northeastward through Chautauqua, Elk, Montgomery, Wilson, Neosho, and Bourbon Counties. Towns of Cherryvale, Neodesha, Fredonia, and particularly Independence and Fort Scott most heavily hit. Plate glass windows, trees, roofs, and small buildings damaged in all towns. One man injured in Independence while running from his home to a storm cellar, and another received injuries in Erie. Property damage by wind, $55,000. Crop damage by wind, $1,000; by hail, $65,000. Estimated damages for Bourbon and Montgomery Counties only.
Denmark, S. C.	24	Afternoon			0	0	12,000		Wind (tornadic)	Another thunderstorm with some evidence of tornadic character.
Columbia (15 miles south of), S. C.	24	3 p.m.			0	0	5,000		do	Thunderstorm apparently with tornadic qualities.
Scobey, Mont.	24	3 p.m.	•2	4				14,000	Hail	Damage to wheat.
Scotts Bluff County (northern portion), and Sioux County (southern portion), Nebr.	24	4-7 p.m.	•15	22			162,000	500,000	Hail and rain	
Williamsport, Pa.	24	4:20-4:50 p.m.					5,000	3,000	Thunderstorm, winds, and hail	Severe thunderstorm, with 1/4-inch hail and high winds, formed and struck about 3 miles north. Trees uprooted or broken off, and blown across cars, poles, wires and railroad tracks. Crop damage mostly to corn and garden produce.
Opheim, Mont.	24	4:30 p.m.	•1	10				Slight	Hail	
Redstone, Mont.	24	4:30 p.m.	•1½	5			Slight	Considerable	do	Damage to wheat and barley.
Fredericksville, Pa.	24	Evening					See remarks		Electrical	Lightning struck and killed heifer.
Ashtabula, Ohio	24	7 p.m.	•2	15			°55,000	°	Hail	
Sidney, Mont.	24	7-7:30 p.m.	•2½					Considerable	do	Damage to beets and small grain.
Baltimore, Md.	24	11:30 p.m.					See remarks		Electrical and wind	Lightning struck cornice of large building, dislodging concrete block 2 feet square. Block fell to street hitting the edge of a pedestrian's umbrella. At least 20 trees uprooted. Electrical and telephone services disrupted in many sections for brief periods.
Susanville-Amadee area, Lassen County, Calif.	24								Hail and rain	Series of thunderstorms occurred in a line squall extending from west of Susanville eastward to and beyond Amadee. Storm unusually severe, according to old timers, and lasted from 3 to 4 hours, depositing from 2 to 4 inches of precipitation in Susanville. Heavy hail in some districts.
Johnstown area, Pa.	25	Midnight-4 a.m.				2	See remarks		Electrical, rain, and winds	This was second major flash flood in 10 days, with over 2 inches of rain in 3 hours. Damage heavier and more general in this storm, with roofs sheared off several homes, and siding and chimneys damaged by wind. Corner of one home ripped off, and this plus rain damage amounted to $1,500. Lightning struck and damaged several buildings. Policeman thrown 10 feet when lightning followed wires to a call box he was using. A woman cut by flying glass when window blew out. Retaining walls washed out, streets and cellars flooded, and roads blocked by silt and debris.
Long Prairie (vicinity of), Minn.	25	A.m.					12,350		Electrical	Large barn and two nearby small buildings destroyed; straw stack burned; electric and communication lines disrupted; church steeple and home damaged; 4 cows and a bull killed by lightning.
Greenwood County, Kans.	25	12:45 p.m.			1	2			do	Man killed, and man and woman injured by lightning at farm home southeast of Lamont.
Sidney (near), Nebr.	25	2:50 p.m.	Narrow	10	0	1	See remarks		Tornado	Most damage at airport, where hangar, house trailer, and one plane badly damaged.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Sedgwick, Colo.	25	3-3:30 p.m.	*6	25		2	$1,500	$75,000	Hail	Storm moved southeastward. Average size of hail as large as golf balls, with largest size of baseballs Property damage confined to windows and roofs; crop damage chiefly to wheat, barley, oats, and corn. Some chickens and turkeys killed.
Martin County, Minn.	25	3:30 p.m.	167	20	0	0	125,000	75,000	Tornado and hail	Barns and outbuildings on 10 farms demolished; house and barns moved from foundations or otherwise damaged; granaries, silos, windmills, farm machinery, and automobiles wrecked or damaged; poultry and livestock perished; haystacks scattered; trees uprooted; poles and wires down; growing crops damaged Storm moved northeastward. Reports of funnel-shaped clouds. First destruction occurred near Dunnell about 3 p.m. and last destruction about 3:30 p.m. about 5 miles southwest of Fairmont. Heavy hail accompanied tornado, causing $75,000 damage to growing crops and $25,000 to real property. Hailstones size of tennis balls reported to have fallen near Dunnell. In Ceylon and Sherburn localities, hailstone size of golf balls reported. Storm moved northeastward.
Chester, Bethlehem Section, S. C.	25	Afternoon						2,500	Hail	
Scotts Bluff County (northern portion), and Sioux County (southern portion), Nebr.	25	4:30 p.m.	*10	42			1,850,000	1,160,000	do	Most of land affected was in high state of cultivation.
Holyoke (16 miles north of), Colo.	25	4:30-5 p.m.	*3		0	0	20,000	15,000	Tornado	Damage mostly to crops, windows, and small buildings.
Atlanta, Ga.	25	Late afternoon				Several	5,000		Electrical, wind, and rain	High winds blew down many power and communication lines and trees. Two power substations put out of commission, leaving some sections without electric service. An automobile and a home slightly damaged when a huge tree was blown down on them. Strong gusts blew out display window plate glass, causing slight damage. Lightning struck an apartment building and resultant fire caused substantial damages to walls and ceilings of two apartments. Heavy rains flooded low-lying sections and basements, with damages in several buildings.
Minnesota, extreme south-central counties	25	P.m.					100,000	1,000,000	Rain and flood	Excessively heavy rains resulted in flash flood in Community Creek near Morton, Renville County. Lowlands flooded; many homes and buildings in Morton and vicinity under water, and 4 families in low sections evacuated. About 350 feet of railroad tracks, implement shed, and several bridges and culverts washed out; highways and roads inundated; growing crops washed out or drowned. Unofficial measurement of about 5 inches of rain in less than 2 hours at Morton. In areas to south, particularly in Martin County, where excessively heavy rains accompanied tornadoes, damage to growing crops estimated at almost $1,000,000, and the loss to property considerable.
Duncan and Crystal Lake, Iowa	25	5:07 p.m.	500	3/4	1	8	4,500,000	1,500,000	Tornado	Tornado moved northeastward, destroying the largest buildings in Duncan. A large church and the community center; all of the 21 homes damaged and some demolished; 1 person killed and 4 injured. At Crystal Lake four houses demolished and many damaged; 4 persons injured. Between Duncan and Crystal Lake four farmsteads demolished. A freight train overturned. Loss to livestock.
Franklin and Hancock Counties, Iowa	25							See remarks	Wind and hail	Tornado described above was part of general wind and hailstorm over wide sections of Franklin and Hancock Counties. Damage to crops from hail cannot be separated from that caused by torrential rains, with an official measurement over 8 inches and unofficial up to 12 inches.
Monona County, Iowa	25	Night					3,000	2,000	Wind	REA lines and telephone lines down. Minor damage to buildings.
Hamilton County, Nebr.	25	9-10 p.m.					800	Slight	do	Damage scattered.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Stratford, Iowa	25	Midnight		½			$5,000		Wind	Damage to buildings.
Bredenton, Tenn.	26	Midnight to 3 a.m.					See remarks	See remarks	Thunderstorm	Some damage to crops. Roads washed badly. Power off for several hours. Over 4 inches of rain fell.
Nemaha County, Kans.	26	5 a.m.					1,500		Electrical	Northeast of Wetmore a shed, car, and baled hay destroyed by lightning; also a barn north of Wetmore struck by lightning and badly damaged.
Sampson County, N.C.	26	2 p.m.				1		$5,000	Hail and electrical	Injury caused by lightning occurred near Clinton.
Sumter, S. C.	26	Afternoon			2				Electrical	Two persons killed by lightning.
Culpeper, Va.	26	3–4 p.m.					600		Wind	Two houses unroofed and a number of trees blown down.
Belleville (Lock 20), W. Va.	26	3:30–3:50 p.m.	330	**330	0	1	4,000	100	Wind and tornado	Farm buildings and trees damaged by high winds. Waterspout drawn up from Ohio River as storm moved eastward across river.
Beaufort, Bertie, Franklin, Greene, Nash, Person, Wake, Rockingham, Wayne and Wilson Counties, N.C.	26	5–7 p.m.					20,000	600,000	Hail	Other areas hit lightly this date.
Columbia, S.C.	26	5:30 p.m.					700		Electrical	Small fires from lightning.
Midland, Mich.	26	P.m.			0	0	25,000		Tornado	Several trees, barns, and one house blown down.
Bottineau and McHenry Counties, N. D.	26	Evening	*2½	20				See remarks	Hail	Hailstorm moving southeastward struck area from north of Upham to about 7 miles southwest and south of Willow City. Three miles north of Upham at Wildlife Refuge hail reported up to 3 inches deep and size of peas. Considerable damage to crops, amounting locally to near a total loss.
Rooks County, Kans.	26	Night					1,500		Electrical	Six cows killed about 7 miles southwest of Stockton.
Hapeville, Ga.	26					1			do	Lightning struck a small child causing second- and third-degree burns.
Union City, Ga.	26				1				do	Lightning struck and killed a section hand for the A. & W. P. Railroad. He had taken refuge under a pine tree when thunderstorm developed.
Gove, Trego, Ellis, Russell, Lincoln, and Saline Counties, Kans.	26–27	11:10 p.m. -3 a.m.		175	5	100	2,075,000	241,800	Tornado, hail, and wind	Severe storm beginning near northwestern corner of Gove County swept eastward or east-southeastward across six counties in path from 2 to 24 miles wide at the beginning and widening to cover about 2 counties with varying degrees of severity. High wind and hail caused considerable damage in Quinter area, and roar of tornado which struck Wakeeney shortly past midnignt could be heard. Tornado destroyed 45 homes, damaged 60 others, and caused the deaths and injuries listed. Damage to property and crops noted at and near Hays, Russell, Lincoln, and Salina from hail and extremely high wind but without tornadic characteristics, except locally at a farm west of Hays. Property damage by tornado, $2,000,000 by wind, $35,000; by hail, $40,000. Crop damage by tornado, $80,000; by hail, $161,800.
Indianapolis, Ind.	27	4–5 a.m.					50,000		Wind, rain, and electrical	Houses struck by lightning. Trees and wires blown down.
Franklin, Ind.	27	4–5 a.m.					25,000		Wind	Damage to wires; trees blown down on cars; buildings damaged.
Spencer, Ind.	27	4 a.m.					15,000		Wind, electrical, and hail	Damage to electric lines and trees. Barn struck by lightning and burned.
Columbus, Ind.	27	4–5 a.m.					30,000		Wind	Trees and wires downed. Homes and autos crushed by falling trees.
Bedford, Ind.	27	4:20 a.m.					50,000		do	Trailer overturned; automobiles damaged by falling limbs; chimneys downed.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Hayden, Zion, and Frayford, Ind.	27	4:30 a.m.	•1	10			$15,000	$7,000	Wind and rain	Wires, trees, and buildings damaged. Hay also damaged.
Shelby County, Ind.	27	4:45 a.m.					25,000	5,000	Wind and electrical	Damage to buildings, trees, and wires.
Greensburg, Ind.	27	4:50 a.m.				2	250,000		Wind	Damage to trees, automobiles, and buildings.
Worth County, Mo.	27	4:50–5:30 a.m.					3,000	1,000	do	Trees and small buildings damaged.
Cincinnati, Ohio	27	6:30 a.m.					50,000		Wind, rain, and electrical	Storm area confined to northern Cincinnati. Greates damage at Tool Steel Gear & Pinion Company. Additional damages caused by storm were fallen trees, broken electric wires disrupting communication and transportation, broken plate glass doors and windows and damaged chimneys.
Butler and Montgomery Counties, Ohio	27	7 a.m.	•5		0	0	250,000	475,000	Tornado, wind, rain, and electrical	Continuation of storm described above for northern Cincinnati on 27th but more severe. Twister moved northeastward, dipping into villages of Jacksonburg and Carlisle. Most damage by high winds and excess water. Winds of 70 m.p.h. Many crops covered with water.
Parkersburg to Reedy area, W.Va.	27	9–10 a.m.					See remarks	0	Wind and electrical	Trees blown down; electric power services disrupted. Barn near Mineral Wells destroyed by fire, as result of being struck by lightning. Farm buildings and automobiles damaged to extent of $200 at Reedy.
Jackson and vicinity, Minn.	27	11:55 a.m.	•6	15			25,000	100,000	Hail and rain	Heavy hail that accompanied a severe thunderstorm caused much damage to growing crops and real proper ty. Greatest losses in Des Moines, Wisconsin, Middletown and Petersburg Townships, Jackson County, and in Sherburn area, Martin County, where some hailstones size of baseballs reported. Roofs of buildings and automobiles punctured. Some fields o growing crops total loss. Much poultry and some livestock perished. Storm moved southeastward. Heavy rains accompanied storm and caused considerable damage.
Jackson and Albert Lea (vicinities of), Minn.	27	11:55 a.m.	•6				10,000		do	Several small buildings demolished and a number of buildings damaged; many trees uprooted; poles and wires down; Drive-in-theatre partly demolished; som small boats wrecked or damaged. Storm moved southeastward. Heavy rains and hail accompanied storm.
Prince Georges County, Md.	27	2–4 p.m.					20,000		Electrical	Barn and contents destroyed by lightning and ensuing fire at Leeland, Maryland.
Warwick County, Va.	27	Afternoon			0	0	1,000	0	Wind (tornadic)	Garage hurled into wood yard, with side walls and roof scattered in all directions. Moved another garage several inches off of its foundation and uprooted nearby tree.
Tunnell Mountain area, Tucker County, W.Va.	27	Afternoon			1		0	0	Wind	Man fatally injured when struck by falling tree, snapped off by driving winds.
Rock Cave, W. Va.	27	Afternoon				2		0	Wind and rain	Two persons injured in crash landing of small plane.
Clarksburg, W. Va.	27	Afternoon				2		0	do	Two persons injured by flying glass when large lobby window in hotel shattered.
Arbovale, W. Va.	27	Afternoon						0	Wind	Barn blown off its foundation. Tree blown down, killing cow beneath.
Beaufort, Bertie, Edgecombe, Hertford, Martin and Pitt Counties, N. C.	27	4–7 p.m.					50,000	1,100,000	Hail	Heaviest damage in Pitt County.
Monroe County (central portion), W. Va.	27	4–5:30 p.m.							Electrical and rain	Portion of city of Union flooded to depth of 2 feet by heavy rains. Lightning surge punctured insulation on electric motor in city's pump house and caused a fire.
Baltimore, Md.	27	4–6 p.m.				3	See remarks		Wind	Most damage to south and southwestern parts of city. Part of a house roof rolled back by strong winds. Tree fell on automobile damaging it severely. In

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										Hollins market stalls overturned and food stuffs strewn about. A grocery store window blown out; flying glass cut two women as they passed. Section of brick wall, about 60 feet long and 14 feet high ripped from a building. Some of the brick fell on a seaman, injuring him slightly. Top of water tower, 30 feet in diameter, carried 200 feet. Galvanized steel roof of storage shed rolled back, exposing 2,000 tons of fish meal and many tons of other cargo.
Darlington and vicinity, S. C.	27	Late afternoon						$5,000	Hail	
Cleveland, Ohio	27	Late afternoon			1	3			Electrical and rain	Severe lightning. Bolt of lightning killed one person and injured 3 others when they took shelter under a tree at Lake Shore Country Club.
Lynchburg, Va.	27	6 p.m.							Electrical and wind	One hundred telephone poles knocked over by falling trees. Lightning set fire to two houses and a shed. Several automobiles damaged by falling trees.
Williamsport, Washington County, Md.	27	P.m.					See remarks		Wind	Blew off roofs of two barns.
Leeland, Md.	27	P.m.					20,000	See remarks	Electrical	Lightning struck a barn and burned it to ground; barn contained 40,000 hands of drying tobacco, 20 tons of fertilizer, and some new hay.
Hagerstown, Md.	27	P.m.					See remarks		Wind	A 111-foot long and 14-foot high wall of a new plant knocked over before concrete had set.
Parke County, Ind.	27	P.m.					6,000		Electrical	House destroyed.
Canton, N.J.	27	P.m.	•1				1,000		Wind	Telephone lines and several trees blown down.
Millville, N. J.	27	P.m.	•1				2,000		do	Power lines and trees blown down. Minor damage to roofs.
Heman and Latham (near), Logan County, Ill.	27	7:30-7:40 p.m.	300	8	1	35	355,000	650,000	Tornado	Accompanied by widespread heavy rains, and severe thunderstorm activity.
Dickinson County (southern portion), Kans.	27	8-11 p.m.	•1½	4		2	30,000	4,000	Electrical and hail	Two persons slightly injured and $700 damages to creamery by two lightning strikes in Herington. Hail damaged roofs and cars and broke glass in greenhouses. Property damage by hail, $29,300; by lightning, $700.
Emden and Hartsburg (near), Logan County, Ill.	27	8:45-9:30 p.m.	200	15	0	15	550,000	700,000	Tornado	Accompanied by widespread heavy rains and severe thunderstorm activity.
St. Paris-Urbana area, Champaign County, Ohio	27	9 p.m.	440	12		3			Wind and rain	Continuation of storm for Butler and Montgomery Counties.
Area east of Illinois River, bordered on north by Fulton, Tazewell, McLean and Vermilion Counties, and on south by Greene, Macoupin, Montgomery, Fayette, Effingham, Cumberland and Clark Counties, Ill.	27-28	Evening and early morning			1		265,000	2,364,000	Thunderstorms, hail, and rain	Heavy damage over large portion of central Illinois. It is impracticable to separate wind, hail, and flood damage totals, due to extensive area involved.
Kingman and Sumner Counties, Kans.	27	Evening					500	2,000	Hail, wind, and electrical	Storm moved southeastward from southwestern Kingman County to southeastern Sumner County. Southwest of Kingman moderate to heavy losses from hail. Near South Haven, in Sumner County, lightning and wind damage occurred. Damages listed were by hail.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Dayton-Smicksburg area, Pa.	27-28	10:30 p.m. -1 a.m.			0	0	See remarks		Tornado	Storm began in Dayton area and moved southeastward t Smicksburg. Two barns unroofed; two silos demolished; trees uprooted and thrown against homes and across highways. Power and phone services disrupted.
Caswell, Rockingham and Stokes Counties, N. C.	27								Wind	Damage to power lines and farm buildings.
Seward County, Kans.	28	1 a.m.					$500		Electrical	Lightning damaged wiring and knocked concrete blocks from wall of apartment in Liberal, weakening side of building.
Seward, Ligonier, and Boswell areas, Pa.	28	1-6 a.m.					See remarks	See remarks	Electrical, rains, and winds	Near Seward, lightning set fire to 3-apartment building, making 21 homeless; damage estimated at $8,000 also, struck another farm home with damage of $500. Ligonier Valley had at least 100 cottages flooded when flash floods sent streams a foot higher than i 1936. Several marooned persons rescued by boat. Lincoln Highway and several other roads blocked by flood waters for several hours. Mountain slides, silt, and debris also blocked highways. Homes and buildings on higher ground had cellars flooded and gardens washed out. Only minor damage reported to power and phone lines.
Haskell County, Kans.	28	3 a.m.					10,000		Wind	High wind with tornadic characteristics in Sublette turned over box cars, ripped buildings, tore wires loose, and broke limbs from trees.
Parke County, Ind.	28	3 a.m.					19,000		Electrical	House and a general store destroyed.
Faucett (near), Mo.	28	4 a.m.	*2	3				$7,000	Hail	Oats suffered most damage. Apples and tobacco also affected. Hail averaged marble size.
Albany (near), Mo.	28	4-5 a.m.	500	Short				See remarks	do	Gardens and field crops destroyed. Hail ½ to 3/4 inch in diameter.
Bourbon County, Kans.	28	9:20 a.m.					3,000		Wind, hail, and rain	High wind accompanying heavy rain and hail destroyed plane and damaged two others at Fort Scott Airport.
Culpeper, Va.	28	2:45-3:30 p.m.					15,000		Wind	Parapet on bank building blown over. A 10-foot chimney on market building blown down. Court house slightly damaged. Several autos damaged by falling trees. Power lines out for several hours.
Fredericksburg, Va.	28	Late afternoon					See remarks		do	Much minor damage. Trees blown down in some section Some damage to power lines.
Callands, Va.	28	5:30 p.m.			1	1	0	0	Electrical	Woman killed by lightning while sitting in a dwelling; her son sitting on her lap unharmed, but another son standing nearby knocked unconscious.
Richmond, Va.	28	P.m.							do	At least three buildings struck; poles knocked down; power lines set afire.
Logan and Gove Counties, Kans.	28	Night					750	600,000	Hail and wind	Hail and strong winds in Oakley uprooted trees, brok windowpanes, and damaged roofs and two airplanes. South of Grainfield, in Gove County, more than 20,000 acres of wheat damaged.
Westmont, Ill.	28				1				Electrical	Woman killed by lightning.
Mitchell County, Kans.	29	After midnight					4,000		do	Fire caused by lightning destroyed home in Cawker City.
Ford County, Kans.	29	Early morning					5,000		do	Lightning struck and resulting fire burned dairy bar with contents of 20 tons of hay, dairy feed, and three milking machines 4 miles south and 2½ east of Dodge City.
Allen County, Kans.	29	3:30 a.m.							do	Fire caused by lightning seriously damaged recently modernized dance hall.
Neosho County, Kans.	29	4-5 a.m.					75,000		do	Oil bulk station warehouse at Erie and barn filled with alfalfa near Chanute both destroyed by fire after being struck by lightning.
Lewes, Del.	29	A.m.					See remarks	See remarks	Wind, rain, and electrical	Heavy rains beat down crops, and winds broke down trees. Lightning struck at least three houses, damaging them somewhat.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Patuxent, Md.	29	A.m.			1	2			Electrical	Lightning struck three workmen while cleaning a beach; one killed and the two others injured.
Henderson County, N.C.	29	4:30 p.m.						$1,000	Hail	
Lee, Davidson and Montgomery Counties, N. C.	29	5-7 p.m.						10,000	do	
Bertie County, N. C.	29	7 p.m.						10,000	do	
Woodward County, Okla.	29	9 p.m.	•4	25-30					do	Damage to farm buildings and wheat crop in northern part of County.
Albertville, Marshall County, Ala.	29				1				Electrical	Lightning struck and killed man as he stood in doorway of his home.
Montgomery County, Kans.	29	9:30-11 p.m.					$12,000		do	Two major fires resulted from lightning in Coffeeville: (1) At 9:30 p.m. an outdoor switch gear at power plant burned out and serious fire developed. (2) At 11 p.m. fire broke out in large building damaging three sections.
Osage County, Kans.	29	Night					2,000		do	Nine head of cattle killed by lightning north of Miller.
Sedgwick County, Kans.	29	Late evening			1				do	Man killed by lightning near Mt. Hope while in his car, which apparently was grounded by a flat tire, the only one to be burned.
Logan County (southern portion), and Wichita County (northern portion), Kans.	29-30	11 p.m.-early a.m.						50,000	Hail	Hail caused serious damage in eastward path along Logan-Wichita County line and extending as far south as Leoti. One storm began about 11 p.m. and another more extensive one occurred after midnight, covering much of 150-square-mile area.
McWhorter and vicinity, W. Va.	29-30	Night	•11	5					Wind and rain	Some flash floods highest since 1888 according to old-timers. Many trees blown down and fences swept away; considerable damage to crops, gardens, farm buildings, and small livestock. Highways and railroad beds washed out.
Vance Air Base and Woodring Municipal Airport, Garfield County, Okla.	29-30	11:40 p.m.-12:20 a.m.	•10	Extensive			10,000		Wind	Numerous tents, carnival concessions for Vance Air Base Jubilee damaged; 14 private planes damaged from $100 to $1,000 each; 100 foot x 150 foot hangar roof and crash house roof partly blown off.
Tulsa, Okla.	30	1:30-8:00 a.m.					15,000		Electrical	Damage to power transformers and telephone cables. Considerable damage to household radios, television sets, and electrical appliances. Several fires started.
Cherokee County, Kans.	30	1:30 a.m.					1,500		do	Near Faulkner, lightning struck cab of 1½-ton truck, setting it afire and burning it completely.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

JUNE 1951

Potential conditions were created during June for one of the most devastating floods in the nation's history in the Kansas-Missouri area, which was to follow in July. The rainfall for June in the state of Kansas averaged over 240 percent of normal. Critical flooding occurred in this area during June but it was minor compared to what was to follow. Several streams in the lower Missouri Basin reached record to near record stages in June.

Several severe flash floods were reported in the Ohio River Basin during the month. Westmoreland County in the Jeannette-Greensburg, Pa., area suffered its greatest damage in history with losses estimated at one million dollars.

ATLANTIC SLOPE DRAINAGE.--Light flooding occurred for a few hours on the North Branch of the Potomac River at Cumberland, Md., on the 13th and 14th and in the lower Potomac near Washington, D. C., at the Leiter gage between the 14th and 16th due to heavy precipitation. Precipitation during the 48-hour period ending on the morning of the 14th averaged 2 inches over the Potomac Basin with amounts up to 2.5 inches in the Cumberland area and 1.8 inches at Washington, D. C. No damages resulted from the flooding.

Minor flooding occurred in the James River Basin on the 14th and 15th and below Bremo Bluff, Va., due to heavy rainfall on the 13-14th ranging from 1 to 4 inches. Heavy rainfall occurred on two other occasions during the first decade of the month. The James River exceeded flood stage from 0.3 foot to 3.7 feet below Scottsville, Va.

The Pee Dee River reached a record low stage of 1.9 feet at Pee Dee, S. C., on the 12th of the month. The previous lowest stage was 2.4 feet recorded on Sept. 23, 1947. The Waccamaw, Black, and Yadkin Rivers were also at extremely low stages during June.

UPPER MISSISSIPPI BASIN.--The heavy rains (2-3 inches) during the last 2 days of May caused flooding in the Raccoon and Des Moines River Basins. The Raccoon crested slightly above 17 feet on the 3rd at Van Meter, Iowa, 4 feet above bank-full stage. Minor overflows occurred on the Des Moines River in the vicinity of Des Moines, Iowa. Overflow was general below this point as far downstream as Ottumwa, Iowa.

Heavy rains (2-3 inches) occurred again on the 7th and 8th below Des Moines, Iowa, causing several of the tributaries of the Des Moines River to go out of their banks. These rains kept the Des Moines River above bank-full stage below Tracy, Iowa, for several days.

Heavy thundershowers in north-central Iowa during the night of the 25th caused rapid rises to above bank-full stage in the headwaters of the Cedar and Boone Rivers and in the smaller tributaries. Several stations reported rainfall amounts of 3 to 5 inches with Allison, Iowa, reporting 8.1 inches.

Some flooding occurred along the main stem of the Mississippi River at Gregory Landing, Mo., and Alton, Ill., during the last few days of May. Local flooding continued at Alton, Ill., during most of the first half of June. The Mississippi began overflowing again at Alton, Ill., on June 27. By the last day of the month the lower Mississippi was in flood in the lower reach from Grafton, Ill., to the mouth of the Ohio River.

MISSOURI BASIN.--Some flooding occurred along the North Fork of the Elkhorn River at Pierce, Nebr., on the 18th due to heavy rains during the night of the 17-18th. The amounts ranged from 2 to 3 inches over the Willow Creek Basin and from 1 to 1.5 inches in the vicinity of Pierce, Nebr. No damage resulted from the flooding.

The Floyd River rose above flood stage on two different occasions during the month from just below Merrill, Iowa, to near James, Iowa. The first rise was due to thundershowers in the vicinity of Hinton and James, Iowa. No damage resulted from this overflow as the bottom lands were flooded for only 15 to 18 hours. The second rise developed on the 26th and continued above flood stage at James, Iowa, from that date until early on the 30th. Some damage resulted to crops.

Thunderstorms and showers caused the Big Sioux River to rise above flood stage in the vicinity of Hawarden and Akron, Iowa, on June 26, 1951, with the overflows progressing downstream to the mouth and remaining above flood stage until July 6.

Perry Creek rose to a dangerously high level in Sioux City, Iowa, during the afternoon of the 19th due to heavy thundershowers over the basin. The rainfall ranged from 1.5 to 2 inches and fell at an excessive rate; 0.73 inch was recorded in 10 minutes in one of these thunderstorms. Perry Creek began receding about 4 p.m. on the same date after reaching the girders on many of the bridges. Firemen were kept busy preventing debris from clogging the stream at the bridges. The creek was within one foot of bank-full through 30 blocks of the city. Only slight overflow occurred at one place near 18th Street.

Heavy rainfall occurred over most of the Boyer Basin in Iowa during the last few days of May and during the first 2 days of June causing rapid runoff, particularly in the middle and upper portions of the basin. The flooding during this rise was confined to local areas, mostly in the upper basin, during the night of May 31-June 1. A second rise occurred in this basin from the heavy rainfall from the 17th to the 19th. Most of the flooding during this rise was confined to the small tributaries of the Boyer and very little flooding along the main stem. No flooding of consequence occurred along the Soldier River Basin from the heavy rain during the first 2 days of the month. A considerable greater runoff occurred in the basin during the period from the 18th to the 20th, where some lowland flooding occurred along the smaller tributaries. Some flooding occurred along the main stem further downstream when a railroad bridge (1 mile north of Pisgah, Iowa) which was being dismanteled, collapsed, blocking the channel and causing some flooding of farm houses. Flooding along the Maple River during this rise appears to have been confined to the low farmlands south of Mapleton, Iowa. No flooding of consequence occurred along the Little Sioux Basin. The most severe flood conditions on record occurred along the Little Papillion Creek in Nebraska on June 1, due to heavy thundershowers on May 31 and June 1. Considerable damage resulted to the Peony Park Amusement Center in Omaha, Nebr., where the damage was estimated at $55,000. The flood water reached a depth of 18 inches on the ballroom floor. Considerable flooding occurred over farmlands along the Little Papillion. Flooding along the Big Papillion Creek in Nebraska was confined chiefly to farmlands.

Heavy rains during the night of May 31-June 1 caused severe flooding along Salt Creek resulting in major damage to residential areas near or in Lincoln, Nebr. Although Salt Creek reached the same stage (42.4 feet) as during the major flood of 1950, the flow was considerably less this time than in 1950 and was much slower with much less violence. At Ashland, Nebr., a stage of 14.25 feet was reached at 10 p.m. on June 1. Another crest of 14.41 feet occurred at 2 a.m. on the 3d. Prolonged flooding resulted in the lower part of Ashland due to the breaking of the dike. Torrential rains during the afternoon of the 14th caused serious flooding along Antelope Creek in a thickly populated residential and business section. Other tributaries of Salt Creek in the southern part of the county were at a moderate height, so dangerous stages were not reached on Salt Creek at Lincoln, Nebr., during this rise.

Damages in the Salt Creek Basin excluding the Antelope Creek were estimated at $1,750,000 by the U. S. Engineers. Probably the major damage was to residential areas near or in Lincoln. Damage to lowland farm areas was quite heavy, particularly in the lower basin. Near Ashland, Nebr., old residents reported the crest stage the highest reached since 1908.

Heavy rains in northeastern Kansas and northern Missouri caused critical flooding in several streams in the lower Missouri Basin during June. The Saline River reached a record stage of 29.8 feet at Tescott, Kans., on the 9th of the month. The Solomon River reached a near record stage at Beloit, Kans., and exceeded the previous maximum stage of record at Minneapolis and Niles, Kans., during the last decade of the month. It reached a near record stage earlier in the month at the two latter points. The Smoky hill River reached near record stages at Salina and Abilene, Kans., and exceeded the previous record stage at Enterprise, Kans. The Little Blue River exceeded the previous record stage at Endicott, Nebr., and the Big Blue exceeded the previous maximum stage at Beatrice, Nebr., early in the month. Critical flooding also occurred along the Delaware, Stranger Creek and Kansas Rivers.

Moderate to severe overflow occurred along the main stem of the Missouri downstream from Kansas City, Mo., during the last decade of the month. Bank-full stage was reached at Kansas City, Mo., on the 22d and it remained above flood stage at this point continuously until the morning of July 3. It reached a crest stage of 25.7 feet on the morning of the 24th, 3.7 feet above flood stage.

During the latter part of May and the month of June potential conditions were developed for the disastrous floods, which were to follow in July on the rivers in eastern and north-central Kansas and in northern and central Missouri. The heaviest rainfall in Kansas during the month of June occurred over eastern and west-central Kansas in the areas drained by the Kansas River and its tributaries in the central and north portions and the Marias des Cygnes in the east-central portion of the state. The rainfall in the state of Kansas during the month of June averaged 9.6 inches for the state as a whole, which was 5.63 inches above normal.

OHIO BASIN.--Numerous storms of moderate to heavy precipitation occurred over the upper portion of the Ohio Basin during the month of June. The precipitation at Pittsburgh, Pa., during the month of June totaled 10.25 inches, exceeding the previous monthly high of 10.08 inches in September 1945 and the previous highest monthly June record of 7.73 inches in 1928.

Only minor rises occurred in the main streams in the upper Ohio Basin regardless of the heavy amounts of rain. However, the Monongahela River did rise rapidly during the 13th and 14th and flood stages were exceeded by 0.5 foot to 3 feet at three points along the lower reach. The Ohio River at Pittsburgh, Pa., exceeded the normal pool stage for a period of about 48 hours and crested at a stage of 21.5 feet on the 14th, 3.5 feet below flood stage.

A flash flood occurred in the Pittsburgh area at the intersection of Washington Boulevard and Allegheny River near Highland Park on the afternoon of the 9th, due to heavy local thundershowers. One person was drowned and a dozen injured when the violent rain completely overwhelmed the sewer system and the torrent ripped up pavements, battered houses and covered autos. The water at its height covered more than a quarter of a mile of the low-lying section of the road and rose to a height of about 10 feet.

Westmoreland County in the Jeannette-Greensburg, Pa. area suffered its greatest flood damage in history. Two inches or more of rain fell in an 18-hour period on the 12th and 13th, falling on ground still soaked from nearly 3 inches of rainfall the previous weekend (9th). The amazing flow of surface water throughout the area reached places never before known to have been flooded. Newspaper accounts describe the area as resembling miniature lakes as water lay as deep as 6 feet for several hours when creeks overflowed and water backwashed from over-taxed storm sewers. Reports indicate that one million dollars damage occurred in the Jeannette-Greensburg area alone. One death resulted.

Heavy thundershowers occurred again on the 28th over practically the same area. Boswell, Pa., reported 3.8 inches, most of which occurred during a 6-hour period. Minor rises occurred in the main streams but the Westmoreland County area which had been so hard hit by the storms on the 13th and 14th received a near knockout blow when the heavy rains occurred again. Although the floodwater in Jeannette and throughout the Brush Creek Valley was about 1.5 feet lower than it was on the 13th, severe property damage resulted, totalling between $500,000 and $1,000,000.

A flash flood occurred at Ronceverte, W. Va., during the late afternoon and evening of the 9th, due to a heavy shower in the upper headwaters of Montgomery Hollow which lasted from 5 to 5:30 p.m. No lives were lost and no serious injuries were reported. A preliminary estimate of the damages resulting from the flooding was placed at $135,000.

The period of daily rains from about the 22d to the 30th caused a rise in the West Fork of the White River to somewhat more than a foot above flood stage at Edwardsport, Ind. Rains were mostly light until about the 27th or 28th when the 2-day total for most of the lower West Fork of White River averaged about 2 inches. Flood damage was insignificant.

WEST GULF OF MEXICO DRAINAGE.--Minor flooding occurred along the Sabine River at Mineola, Tex., on two different occasions during the month. The first overflow was due to heavy showers (1.25 inches) from the 3d to the 5th and lasted 5 days. The second overflow was due to numerous showers during the second week averaging around 2 inches.

Heavy thundershowers over the upper Trinity River Basin on the evening of the 2d caused a 7-foot overflow along the East Fork of the Trinity at Rockwall, Tex., and minor flooding along the main stem of the Trinity from Dallas to Trinidad, Tex., during the first decade of the month. There was a similar rise in the Trinity some 10 days later when another series of heavy rains occurred over the Upper Trinity. There was insufficient flooding during both rises to cause any general overflow of farmlands so loss and damage are negligible.

Minor flooding occurred along the Guadalupe River during the first decade of the month due to heavy rains from the 2d to the 4th ranging from 3 to 5 inches. Since the rains were of rather short duration the runoff was greater than usual and the river rose rapidly at Gonzales, Tex., to a stage of 24.2 feet and then fell rapidly, being above flood stage less than 24 hours. By the time the crest reached Victoria, Tex., it had flattened out some, and while 65,000 acres were inundated only minor damage resulted to standing crops.

Exceptionally heavy rain (5.68 inches) occurred over the north part of San Antonio and the area to the north of the city on the morning of June 3 between 5 and 8 a.m. All the underpasses on the north side of town were flooded and the lowlands adjacent to the many small creeks were flooded. An estimated damage of $200,000 was reported to roads, streets and bridges in that area. No lives were lost and damage to homes and personal property was light.

ARKANSAS BASIN.--Minor flooding occurred along the North Canadian River at Oklahoma City, Okla., on June 11 due to rainfall ranging from 0.5 to 1 inch in and around Oklahoma City. No damage resulted.

An average of 6 to 8 inches of rainfall occurred over the Little Arkansas, the lower portion of the Big Arkansas and the Walnut Rivers during the last 10 days of June causing moderate overflow along those streams. Sandbagging along the Little Arkansas saved the Wichita-Riverside, Kans., area from a moderate overflow which would have caused considerable damage. New dikes around Winfield, Kans., and below prevented bad flooding in that area. The only severe damage in the area was a new development in West Wichita known as the Big Slough District. A dike gave way about 10 miles upstream at Maize, Kans., and caused a damaging overflow through the new residential area on June 30.

There were only 2 days during the month on which no rainfall was reported in the Arkansas Basin. The month of June exceeded all previous records for days with effective rainfall and average monthly rainfall amounts exceeded all previous records over the northern portions. While only one stage record was broken, several maxima were approached. The Cottonwood River crested at Cottonwood Falls, Kans., at a stage of 16.4 feet on the 30th, establishing a new observed highest stage at that station. The Arkansas River at Wichita, Kans., crested at a stage of 13.4 feet, 0.1 foot below the record stage of 13.5 feet. The Verdigris River at Independence, Kans., crested at a stage of 46.6 feet on July 2, one foot under the previous maximum stage.

RED BASIN.--Minor flooding occurred along the Sulphur River at Hagansport, Tex., on three separate occasions during June. The overflows were due to heavy rain (2 to 5 inches) over the extreme headwaters on the 3d, and to additional light to locally heavy showers on the 5th and 6th. Heavy showers averaging 3.9 inches occurred over the Sulphur Basin on the 11th and 12th causing moderate flooding below Hagansport, Tex., the latter third of the month.

Numerous moderate to locally heavy rains occurred over the Little River System early in June causing minor flooding at Horatio and Whitecliffs, Ark.

GULF OF CALIFORNIA DRAINAGE.--Minor flooding occurred along the Eagle River at Eagle, Colo., in the Colorado River Basin from the 18th to the 23d causing minor damage to a private foot bridge and road.

COLUMBIA BASIN.--A warm period near the middle of the month caused the Flathead River to rise to bank-full stage at Columbia Falls, Mont., on the 16th. No damage resulted.

The Columbia River crested at Vancouver, Wash., on May 27 at a stage of 21.5 feet. A secondary crest of 20.7 feet occurred on June 1. The Willamette River crested at Portland, Oreg., at a stage of 21.1 feet on May 27 with a secondary crest of 20.7 feet occurring at midnight on May 31. The crest stages for the spring-summer flood this year were the lowest since 1947. There was no known loss of property. The only damage was that due to submersion of pasture and some farmlands and bank erosion.

FLOOD STAGE DATA

(All dates in June unless otherwise specified)

Table 5

JUNE 1951

River and station	Flood stage	Above flood stages -dates		Crest*	
		From–	To–	Stage	Date
	Ft.			Ft.	
ATLANTIC SLOPE DRAINAGE					
North Branch: Cumberland, Md.	17	13	14	17.7	13
Potomac: Washington (nr), D. C.	10	14	16	12.1	15
James:					
Bremo Bluff, Va.	19	14	15	20.8	15
Columbia, Va.	18	14	15	21.3	14
State Farm, Va.	12	14	16	15.7	15
Richmond, Va.	8	15	15	8.3	15
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Cedar: Waterloo, Iowa	15	27	28	17.0	27
Iowa: Marshalltown, Iowa	13	1	4	14.5	----
Boone: Webster City, Iowa	10	27	30	13.4	28
Raccoon: Van Meter, Iowa	13	2	6	17.2	3
Middle: Indianola, Iowa	--	7	8	15.7	8
Des Moines:					
Des Moines, Iowa (Scott Street)	13	4	5	13.6	4
Tracy, Iowa	14	3	12	16.9	6
Eddyville, Iowa	15	3	13	18.9	8-10
Ottumwa, Iowa	9	4	14	12.3	8
Mississippi:					
Gregory Landing, Mo.	12	7	13	13.2	9
Grafton, Ill.	18	21	21	18.0	21
		30	**	----	----
St. Louis, Mo.	30	28	**	----	----
Chester, Ill.	27	27	**	----	----
Cape Girardeau, Mo.	32	28	**	----	----
Missouri Basin					
Big Sioux: Akron, Iowa	12	26	July 6	16.1	July 1
Floyd: James, Iowa	16	19	20	17.6	19
		26	30	17.7	29
Salt Creek:					
Lincoln, Nebr.	40	1	3	42.4	2
Ashland, Nebr.	11	1	3	14.5	2
Papillion Creek: Fort Crook, Nebr.	19	May 31	3	23.0	3
North Fork: Pierce, Nebr.	12	18	18	12.7	18
Nemaha: Falls City, Nebr.	20	2	2	25.9	2
		22	22	21.6	22
Nodaway: Clarinda, Iowa	14	2	2	14.8	2
Platte: Agency, Mo.	20	21	24	22.0	23
Saline:					
Wilson, Kans.	12	7	7	20.2	7
		9	10	16.0	10
		22	25	22.0	23
		27	30	22.0	29
Tescott, Kans.	25	7	13	29.8	9
		21	July 5	29.1	22
				29.6	25
				29.3	July 1
Solomon:					
Alton, Kans.	12	7	9	18.8	7
				13.3	8
		14	15	16.7	14
		22	24	19.9	22
				22.6	23
		28	28	17.5	28
		29	29	13.8	29
Kirwin, Kans.	13	8	8	16.8	8
		22	23	20.0	22
				19.5	22-23
Beloit, Kans.	20	2	4	25.6	4
		7	14	32.2	9
				20.5	14
		16	17	22.1	17
		22	July 2	35.4	24
				27.3	30
Minneapolis, Kans.	26	9	15	31.6	12
		21	July 4	31.7	23
				32.2	27
Niles, Kans.	24	7	17	28.2	9
				29.5	14
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin (Cont'd.)					
Solomon: (Cont'd.)					
Niles, Kans. (Cont'd.)		21	July 5	31.2	21
				29.6	22
				29.5	25
				30.6	27
Smoky Hill:					
Smoky Hill, Kans.	8	5	5	13.1	5
		11	11	10.0	11
Gove, Kans.	14	6	7	19.3	7
Elkader, Kans.	8	10	12	8.6	11
Ellsworth, Kans.	20	7	8	22.5	7
				20.7	8
Lindsborg, Kans.	21	21	21	21.2	21
		24	24	22.2	24
		29	30	21.8	29
Abilene, Kans.	22	7	18	25.9	9
				26.1	14
		22	July 7	24.8	23
				24.6	25
				26.3	28
Enterprise, Kans.	26	7	19	29.7	8
				29.6	10
		22	July 8	30.1	15
				30.3	23
				31.4	28
North Fork: Benkelman, Nebr.	5	11	11	5.7	11
		22	22	5.1	22
Republican:					
Cambridge, Nebr.	6	8	8	7.4	8
		11	11	7.3	11
		18	18	6.8	18
		23	23	6.5	23
Orleans, Nebr.	[illegible]	19	19	9.1	19
Norton, Kans.	17	22	23	21.5	22-23
Guide Rock, Nebr.	10	2	2	10.5	2
		7	7	10.3	7
Hardy, Nebr.	11	2	2	12.7	2
		7	7	12.2	7
Scandia, Kans.	10	2	2	11.1	2
		7	7	11.2	7
Concordia, Kans.	10	2	2	10.4	2
		7	7	10.3	7
		23	23	10.2	23
Clay Center, Kans.	15	3	3	17.6	3
		7	9	18.4	8
		15	15	15.0	15
		21	25	20.3	22
		26	27	15.5	26
		28	29	16.8	28
Wakefield, Kans.	11	[illegible]	8	11.5	8
		21	24	13.7	22
		28	28	11.8	28
Junction City, Kans.	10	8	9	11.0	9
		21	24	14.3	23
				13.6	23-24
		28	29	11.8	23
				11.6	29
Little Blue:					
Endicott, Nebr.	9	2	4	12.5	3
				13.8	4
		[illegible]	9	9.2	9
		22	23	10.7	22
		26	30	16.6	27
				17.9	28
Hanover, Kans.	14	3	4	14.1	4
		4	5	15.0	5
		22	24	15.5	22
		26	30	22.1	28
Big Blue:					
Ulysses, Nebr.	15	May 31	3	21.2	1
Seward, Nebr.	8.5	1	2	11.0	2
Crete, Nebr.	16	2	6	28.3	3
		7	7	17.1	7
		18	20	22.1	19
Beatrice, Nebr.	16	2	7	28.3	4
		15	15	16.9	15
		27	27	17.2	27
Barnston, Nebr.	18	2	[illegible]	25.8	3
				27.5	4-5
				25.6	7
		14	16	25.5	15

FLOOD STAGE DATA

(All dates in June unless otherwise specified)

Table 5–Continued

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			Ft.	
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin (Cont'd.)					
Big Blue: (Cont'd.)					
Barnston, Nebr. (Cont'd.)		21	21	19.9	21
		22	24	23.5	23
				20.8	24
		26	28	24.9	26
Marysville, Kans.	35	3	8	39.5	5
				40.0	7
		15	16	40.2	15
		21	24	37.7	22
				36.5	24
		26	28	39.3	26
Blue Rapids, Kans.	20	3	9	26.5	4
				28.2	5
				27.1	6
				28.6	7
		15	17	28.1	16
		21	25	29.6	21
				29.4	23
				26.7	24
		26	30	34.5	28
Randolph Kans.	22	4	9	24.0	6
				25.4	7
				25.8	8
		15	17	25.3	16
		21	30	28.2	22
				28.6	28
Soldier Creek: Topeka, Kans.	25	22	23	28.2	22
		26	26	25.2	26
Delaware: Valley Falls, Kans.	22	21	23	32.3	21
		29	29	22.2	29
Wakurusa: Lawrence, Kans.	23	26	28	29.1	27
Stranger Creek: Tonganoxie, Kans.	23	22	July 1	26.7	24-28
				26.3	30
Kansas:					
Ogden, Kans.	18	8	9	18.7	9
		22	July 2	21.6	24
				23.4	29
Manhattan, Kans.	17	4	4	17.7	4
		7	19	23.0	9
				21.1	16
				21.4	17
		21	July 9	24.9	23
				25.2	24
				26.8	29
Wamego, Kans.	16	7	10	18.9	8
		16	17	17.5	17
		22	July 2	21.6	23
				22.9	29
Topeka, Kans.	21	8	10	22.8	10
		18	18	21.1	18
		22	July 2	27.8	24
				29.0	30
Lecompton, Kans.	17	8	10	18.0	9
		16	18	19.2	17
		22	July 2	24.4	23
				23.5	30
Lawrence, Kans.	18	9	10	18.4	10
		22	July 2	25.6	23
				24.5	30
Bonner Springs, Kans.	21	23	July 2	25.7	24
				24.8	28
				25.6	July 1
Blue: Kansas City, Mo. (Bannister Rd.)	21	26	26	21.2	26
Grand:					
Pattonsburg, Mo.	20	20	23	25.0	22
		26	28	24.7	27
Gallatin, Mo.	20	23	23	21.0	23
Chillicothe, Mo.	18	3	3	19.4	3
		20	30	27.6	23
				28.3	28
Sumner, Mo.	25	3	3	25.3	3
		20	July 2	31.4	24
				32.4	30
Brunswick, Mo.	12	3	13	15.3	5
		21	**	23.7	July 1
Chariton:					
Novinger, Mo.	20	22	23	20.9	23
		26	27	21.5	27
Keytesville, Mo.	20	27	29	21.8	28
Blackwater: Blue Lick, Mo.	25	25	**	----	------
Lamine: Clifton City, Mo.	15	9	9	19.0	9
		12	13	21.0	13
		24	25	23.0	25
		27	July 1	32.5	29

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			Ft.	
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin (Cont'd.)					
Pottawatomie Creek: Granett, Kans.	26	24	24	27.3	24
		30	30	28.4	30
Marais des Cygnes:					
Quenemo, Kans.	30	9	9	30.5	9
		30	July 1	30.9	July 1
Ottawa, Kans.	24	9	9	24.8	9
Osawatomie, Kans.	28	9	11	30.7	10
		26	July 3	33.4	28
				34.0	30
				34.4	July 1
La Cygne, Kans.	25	9	12	27.6	10
		25	July 5	31.1	30
				30.3	July 3
Trading Post, Kans.	24	25	**	30.3	July 1
Osage:					
Osceola, Mo.	22	30	**	----	------
Warsaw, Mo.	31	25	25	31.2	25
		27	**	----	------
Lakeside, Mo.	60	26	**	----	------
St. Thomas, Mo.	23	29	**	----	------
Gasconade: Jerome, Mo.	15	30	**	----	------
Missouri:					
Nebraska City, Nebr.	15	1	4	18.5	2
		20	21	15.1	21
		29	29	15.1	29
St. Joseph, Mo.	17	2	5	19.5	4
		21	23	18.2	21
Kansas City, Mo.	22	22	**	25.8	24
				25.6	28, July 1
Lexington, Mo.	22	3	13	25.2	5
				25.0	9
		16	17	23.8	17
		21	**	26.8	24
				27.4	29
Waverly, Mo.	18	3	13	21.2	6
				21.3	9
		16	18	20.0	17
		21	**	25.7	25
				26.8	30
Boonville, Mo.	21	22	**	29.4	July 1
Jefferson City, Mo.	23	24	**	----	------
Hermann, Mo.	21	9	13	22.4	12
		23	**	----	------
St. Charles, Mo.	25	8	8	25.2	8
		10	14	26.8	13
		23	**	----	------
Ohio Basin					
Monongahela:					
Lock No. 5, Brownsville, Pa. Upper gage	23	13	14	23.6	14
Lock No. 4, Charleroi, Pa. Upper gage	24	13	14	26.9	14
Lock No. 2, Braddock, Pa. Upper gage	22	14	15	24.5	14
West Fork: Edwardsport, Ind.	12	30	30	13.0	30
Arkansas Basin					
Little Arkansas:					
Sedgwick, Kans.	18	29	30	22.9	30
Ripley, Kans.	12	29	July 1	15.0	30
Ninnescah: Belle Plaine, Kans.	18	24	25	18.4	25
Walnut:					
Augusta, Kans.	23	30	**	33.8	30
Winfield, Kans.	30	30	**	31.8	30
				36.0	30
Cimarron: Perkins, Okla.	11	26	26	11.5	26
Caney: Bartlesville, Okla.	29	30	**	----	------
Verdigris:					
Independence, Kans.	30	25	26	33.7	25
		29	**	----	------
Coffeyville, Kans.	20	30	**	----	------

FLOOD STAGE DATA

(All dates in June unless otherwise specified)

Table 5-Continued

River and station	Flood stage	Above flood stages -dates		Crests*	
		From–	To–	Stage	Date
	Ft.			Ft.	
MISSISSIPPI SYSTEM (Cont'd.) Arkansas Basin (Cont'd.)					
Cottonwood:					
Cottonwood Falls, Kans.	9	9	10	11.2	9
		29	**	16.4	30
Emporia, Kans.	20	8	11	24.0	11
		30	**	29.1	30
Neosho:					
Emporia, Kans.	22	7	8	26.9	8
		16	16	24.5	16
Neosho Rapids, Kans.	23	8	9	24.8	9
Burlington, Kans.	27	9	11	28.8	10
		24	24	27.3	24
Le Roy, Kans.	23	11	12	23.0	11
				23.1	12
		24	25	24.2	24
		30	**	----	--
Iola, Kans.	15	11	13	16.9	12
		24	26	16.7	25
		30	**	----	--
Chanute, Kans.	20	12	13	21.4	13
		24	27	22.8	25
		30	**	----	--
Parsons, Kans.	24	30	**	----	--
Oswego, Kans.	17	15	15	17.0	15
		25	**	19.3	28
North Canadian: Oklahoma City, Okla.	12	11	11	12.7	11
Arkansas:					
Great Bend, Kans.	8	23	27	10.7	25
Hutchinson, Kans.	7	25	30	8.7	29
Wichita, Kans.	9	30	**	12.8	30
Arkansas City, Kans.	16	9	9	17.3	9
		24	26	18.5	25
		30	30	16.9	30
Ralston, Okla.	16	25	28	18.0	27
Red Basin					
Little:					
Horatio, Ark.	21	--	--	29.2	16
Whitecliffs, Ark.	25	16	20	26.5	18
Sulphur:					
Hagansport, Tex.	38	4	4	40.2	4
		6	8	40.1	7
		11	19	42.2	13
Naples, Tex.	22	14	25	28.1	19
McCartney Bridge, Tex.	22	21	July 3	26.6	23
WEST GULF OF MEXICO DRAINAGE					
Sabine: Mineola, Tex.	14	9	13	17.1	10
		16	24	17.4	18
East Fork: Rockwall, Tex.	10	3	7	17.1	5
		12	20	16.6	13
Trinity:					
Dallas, Tex.	28	3	4	30.5	4
		16	17	31.4	17
Rosser, Tex.	26	3	9	29.9	6
		15	21	30.9	17
Trinidad, Tex.	28	6	13	32.6	11
		17	25	35.2	22
Guadalupe:					
Gonzales, Tex.	21	5	5	24.2	5
Victoria, Tex.	21	7	8	24.0	8
GULF OF CALIFORNIA DRAINAGE Colorado Basin					
Eagle: Eagle, Colo.	5	18	23	5.7	21-22
PACIFIC SLOPE DRAINAGE Columbia Basin					
Flathead: Columbia Falls, Mont.	14	16	16	14.0	16
Columbia: Vancouver, Wash.	15	17	30	17.5	21

* Provisional.
** Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

JUNE 1951

Standard pressure surface (mb)	ALBANY, N. Y. (1004 MB.)				ALBUQUERQUE, N. MEX. (834 MB.)				ATLANTA, GA. (981 MB.)				BIG SPRING, TEX. (921 MB.)				BISMARCK, N. DAK. (954 MB.)				BOISE, IDAHO (913 MB.)				BROWNSVILLE, TEX. (1010 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	86	17.0	77	30	1,620	25.9	14	30	307	23.5	71	30	784	26.7	48	30	505	15.4	74	30	868	20.1	40	29	6	26.5	85
1,000	29	124	17.6	73	30	18			30	133			30	48			30	101			30	70			29	98	26.0	84
950	29	570	16.7	64	30	453			30	589	24.1	64	30	511			30	542			30	523			29	555	24.2	74
900	29	1,023	14.1	66	30	940			30	1,057	21.4	65	30	990	26.6	45	30	999	13.9	59	30	988	20.4	31	29	1,023	22.9	58
850	29	1,503	11.1	66	30	1,448			30	1,550	17.8	69	30	1,492	23.7	44	30	1,478	10.3	62	30	1,478	16.9	30	29	1,520	20.7	50
800	29	2,008	8.8	55	30	1,981	24.6		30	2,066	14.1	68	30	2,019	20.4	43	30	1,980	6.6	66	30	1,990	12.5	35	29	2,042	17.8	46
750	29	2,548	6.0	53	30	2,544	19.8		30	2,615	10.5	66	30	2,578	16.7	40	30	2,513	3.2	64	30	2,531	8.1	41	29	2,595	14.8	39
700	29	3,102	3.1	51	30	3,128	14.4		30	3,180	7.3	59	30	3,156	12.9	32	30	3,062	-0.4	63	30	3,092	3.6	46	29	3,171	11.5	38
650	28	3,702	-0.2	49	30	3,752	8.7		30	3,794	3.7	55	30	3,774	8.0	35	30	3,661	-3.5	54	30	3,690	-0.6	44	29	3,791	7.9	36
600	28	4,336	-3.6	48	30	4,401	2.6	24	30	4,432	-0.3	52	29	4,427	3.1	35	30	4,280	-6.9	47	30	4,324	-4.9	37	29	4,442	3.6	34
550	28	5,023	-7.4	45	29	5,097	-3.8	32	30	5,128	-4.4	46	29	5,126	-2.2	34	30	4,958	-11.3	38	29	5,009	-9.1		29	5,146	-0.9	36
500	28	5,755	-11.7	41	28	5,842	-10.5	39	30	5,868	-8.6	39	29	5,875	-7.7		30	5,678	-16.6	33	29	5,737	-14.0		29	5,898	-5.4	37
450	28	6,557	-17.0	40	28	6,650	-17.2		30	6,686	-13.5		27	6,692	-13.3		30	6,468	-22.3		29	6,532	-19.7		29	6,722	-10.7	37
400	28	7,428	-23.0	39	28	7,516	-23.1		30	7,564	-19.5		26	7,570	-20.1		29	7,315	-29.0		27	7,393	-26.2		29	7,614	-17.0	38
350	28	8,391	-30.1	39	28	8,480	-30.5		29	8,541	-26.2		26	8,546	-27.3		29	8,254	-36.5		27	8,344	-33.7		29	8,601	-24.1	35
300	28	9,470	-38.2		27	9,561	-38.5		27	9,630	-34.5		26	9,639	-35.0		29	9,304	-44.5		27	9,406	-42.0		28	9,708	-32.4	
250	28	10,698	-47.7		27	10,791	-47.3		26	10,875	-44.7		25	10,891	-44.2		28	10,498	-52.1		27	10,617	-50.5		28	10,967	-42.2	
200	28	12,141	-56.5		26	12,239	-55.3		25	12,329	-56.0		25	12,353	-54.8		28	11,927	-55.3		23	12,069	-55.4		27	12,436	-54.1	
175	27	12,991	-59.4		24	13,072	-58.2		25	13,171	-60.7		25	13,197	-59.5		28	12,780	-54.2		22	12,922	-55.8		27	13,280	-60.3	
150	26	13,946	-60.2		24	14,035	-60.8		23	14,110	-64.1		25	14,150	-64.2		24	13,754	-52.8		20	13,906	-55.9		27	14,226	-66.5	
125	24	15,088	-60.1		23	15,167	-63.8		21	15,219	-65.6		24	15,258	-67.6		23	14,933	-53.8		20	15,062	-56.7		26	15,317	-71.4	
100	24	16,477	-60.7		23	16,519	-68.4		20	16,573	-66.9		22	16,581	-70.9		23	16,366	-53.7		19	16,482	-56.6		25	16,620	-74.1	
80	21	17,859	-59.5		20	17,858	-65.3		15	17,920	-65.8		15	17,902	-68.0		20	17,797	-54.3		15	17,895	-56.1		24	17,925	-70.8	
60	11	19,679	-56.8		13	19,648	-59.8		12	19,680	-61.6		13	19,649	-60.9		11	19,657	-54.2		5	19,764	-54.7		13	19,661	-62.3	
50	8	20,809	-55.3		6	20,804	-57.4		11	20,823	-57.4		7	20,809	-57.1		6	20,792	-54.2						9	20,780	-59.7	
40	5	22,229	-52.4																						5	22,179	-56.0	

Standard pressure surface (mb)	BUFFALO, N. Y. (989 MB.)				BURRWOOD, LA. (1015 MB.)				CAMAGUEY, CUBA (1002 MB.)				CARIBOU, MAINE (992 MB.)				CHARLESTON, S. C. (1014 MB.)				CIUDAD VICTORIA, MEX. (970 MB.)				COLUMBIA, MO. (985 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	221	17.6	79	30	3	26.3	83	27	122	23.8	92	30	191	12.7	81	30	13	22.9	88	26	335	30.7	53	30	239	20.5	83
1,000	30	120			30	135	26.3	79	27	140	23.8	91	30	124			30	134	24.3	78	26	65			30	103		
950	30	566	18.3	64	30	592	23.2	76	27	597	23.2	79	30	560	13.8	59	30	588	23.5	65	26	528	29.2	55	30	554	20.9	71
900	30	1,024	15.6	65	30	1,057	21.1	60	27	1,062	21.0	71	30	1,011	10.7	63	30	1,056	20.8	64	26	1,005	25.2	61	30	1,016	18.6	67
850	30	1,507	12.3	68	30	1,550	18.1	59	27	1,556	18.1	67	30	1,485	7.4	67	30	1,548	17.3	64	26	1,505	21.2	67	30	1,505	16.1	65
800	30	2,013	9.5	61	30	2,067	15.1	54	27	2,073	14.9	64	30	1,982	4.2	67	30	2,063	13.7	64	26	2,028	17.5	68	30	2,018	13.1	62
750	30	2,550	6.3	57	30	2,618	12.0	48	27	2,614	11.7	58	30	2,511	1.4	62	30	2,611	10.3	57	26	2,583	14.0	66	30	2,567	10.1	60
700	30	3,109	3.3	46	30	3,187	8.8	44	27	3,192	8.3	56	30	3,057	-1.1	49	30	3,176	7.1	51	25	3,159	10.7	56	30	3,129	6.7	58
650	30	3,711	0.1	39	30	3,802	5.3	45	26	3,803	4.8	56	30	3,651	-3.8	46	30	3,788	3.4	47	24	3,780	7.0	43	30	3,740	2.7	55
600	30	4,343	-3.2	36	30	4,446	1.4	40	26	4,450	1.0	53	30	4,274	-7.3	46	30	4,428	-0.3	45	25	4,427	3.3	42	30	4,377	-1.2	48
550	30	5,031	-7.4	38	30	5,146	-2.8	38	26	5,148	-2.8	46	29	4,953	-11.3	40	30	5,119	-4.4	44	25	5,128	-1.0	42	30	5,067	-5.7	41
500	30	5,762	-11.7		30	5,890	-7.5	36	26	5,895	-7.2	42	30	5,672	-15.6	33	30	5,864	-8.8	39	22	5,879	-5.5	38	30	5,806	-10.4	35
450	30	6,565	-17.0		30	6,712	-12.6	32	25	6,714	-12.1	37	29	6,467	-20.6		30	6,680	-13.6	35	20	6,707	-10.2		30	6,613	-15.7	
400	29	7,434	-23.1		30	7,593	-18.7	34	26	7,601	-17.9		30	7,322	-26.4	37	30	7,561	-19.1	33	19	7,595	-16.0		30	7,488	-22.1	
350	29	8,397	-30.1	39	30	8,574	-25.7	35	26	8,587	-24.8		30	8,273	-33.4		30	8,541	-26.2		19	8,587	-23.1		30	8,456	-29.3	
300	29	9,474	-38.7		30	9,673	-33.9	36	26	9,691	-32.7		30	9,338	-41.3		30	9,637	-34.7		18	9,697	-31.6		30	9,538	-37.5	
250	29	10,700	-48.1		29	10,925	-43.7		26	10,951	-42.6		30	10,553	-49.7		29	10,885	-44.9		17	10,964	-41.6		30	10,772	-46.6	
200	28	12,142	-56.3		29	12,387	-55.2		25	12,426	-54.3		30	11,991	-54.9		29	12,338	-56.5		16	12,437	-53.3		30	12,222	-55.5	
175	28	12,986	-57.7		28	13,226	-61.0		25	13,271	-60.3		29	12,845	-54.3		29	13,174	-61.4		16	13,285	-59.4		30	13,067	-57.9	
150	27	13,950	-58.5		28	14,171	-66.0		25	14,219	-66.0		28	13,837	-53.8		29	14,122	-64.1		15	14,243	-65.6		29	14,032	-59.7	
125	25	15,101	-59.6		28	15,267	-69.7		23	15,314	-70.2		27	15,003	-54.6		27	15,228	-66.6		13	15,342	-70.8		26	15,167	-62.1	
100	22	16,484	-59.8		26	16,588	-72.4		22	16,631	-72.7		25	16,426	-55.5		21	16,568	-67.1		7	16,657	-73.5		25	16,539	-63.9	
80	17	17,865	-58.1		21	17,918	-69.2		20	17,945	-70.9		23	17,842	-55.2		17	17,915	-65.1						20	17,901	-61.6	
60	9	19,692	-56.4		11	19,648	-62.6		15	19,654	-65.5		12	19,667	-53.5		13	19,705	-61.1						16	19,698	-58.3	
50	7	20,867	-55.4						14	20,789	-60.2		5	20,836	-51.6		9	20,831	-58.9						13	20,858	-56.1	
40	5	22,314	-53.1						11	22,185	-56.8						5	22,213	-55.1						6	22,268	-54.5	
30									7	24,020	-53.2																	

Standard pressure surface (mb)	DODGE CITY, KANS. (921 MB.)				EL PASO, TEX. (876 MB.)				ELY, NEV. (808 MB.)				GLASGOW, MONT. (938 MB.)				GRAND JUNCTION, COLO. (848 MB.)				GREAT FALLS, MONT. (888 MB.)				GREENSBORO, N. C. (984 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	792	19.8	75	30	1,195	30.1	15	30	1,908	17.7	33	30	648	15.8	57	30	1,474	20.9	29	30	1,128	12.1	64	30	273	21.0	83
1,000	30	74			30	2			30	34			30	101			30	21			30	112			30	132		
950	30	523			30	475			30	493			30	548			30	484			30	557			29	584	22.0	67
900	30	993	20.2	67	30	962			30	969			30	1,002	13.9	52	30	957			30	1,013			30	1,047	19.7	66
850	30	1,485	17.9	65	30	1,467	29.1		30	1,463			29	1,481	10.4	54	30	1,456			30	1,489	10.4	55	30	1,537	16.3	69
800	30	2,002	15.2	63	30	2,001	24.5		30	1,988	18.0	28	30	1,983	6.4	60	30	1,982	19.5	25	30	1,990	6.9	57	30	2,051	12.9	71
750	30	2,552	12.4	60	30	2,565	19.3		30	2,540	14.2	29	30	2,517	2.3	65	30	2,535	14.6	28	30	2,522	2.9	63	30	2,599	9.5	66
700	30	3,123	9.0	50	30	3,147	14.0	23	30	3,113	9.2	35	30	3,063	-1.7	65	30	3,109	9.6	33	30	3,071	-1.1	67	30	3,161	6.2	63
650	30	3,734	5.0	45	30	3,768	8.4	27	30	3,724	3.8	42	29	3,656	-5.1	58	30	3,723	4.4	38	30	3,663	-5.2	69	30	3,769	2.8	55
600	30	4,380	0.3	42	29	4,419	2.7	31	30	4,365	-1.8	51	29	4,275	-8.7	51	30	4,364	-1.1	44	30	4,283	-9.3	64	30	4,409	-1.0	53
550	30	5,069	-4.9	40	29	5,117	-3.1	35	29	5,053	-7.2	57	29	4,949	-13.1	47	29	5,053	-6.9	47	29	4,960	-13.6	57	29	5,101	-5.1	49
500	30	5,813	-10.2	40	29	5,862	-8.5		30	5,786	-13.0	57	29	5,664	-18.0	40	29	5,785	-13.0	51	29	5,672	-18.4	49	29	5,844	-9.2	42
450	30	6,620	-15.9	39	28	6,674	-14.4		29	6,591	-18.6	51	28	6,448	-24.0	38	29	6,582	-19.0	44	29	6,454	-24.0	43	29	6,658	-14.2	
400	30	7,495	-22.1	37	28	7,551	-20.6		28	7,449	-24.7	42	28	7,290	-30.6	38	29	7,444	-25.7	38	29	7,299	-30.5	39	29	7,537	-19.8	
350	28	8,161	-29.5		25	8,513	-28.5		28	8,406	-32.0	38	28	8,223	-38.1		29	8,397	-33.0		28	8,233	-37.8		29	8,514	-26.7	
300	27	9,540	-37.6		25	9,599	-36.7		28	9,475	-40.2		28	9,266	-46.0		28	9,460	-41.3		29	9,276	-45.8		29	9,607	-35.1	
250	27	10,773	-46.5		25	10,837	-45.9		28	10,695	-49.1		27	10,463	-52.7		27	10,670	-49.5		27	10,470	-52.5		28	10,852	-44.8	
200	27	12,222	-55.4		25	12,290	-55.0		28	12,131	-56.4		26	11,907	-51.2		26	12,110	-56.2		26	11,901	-53.0		27	12,310	-55.6	
175	27	13,068	-58.2		25	13,135	-58.9		27	12,978	-56.7		26	12,776	-50.5		24	12,967	-56.1		24	12,765	-52.6		27	13,151	-60.1	
150	27	14,034	-59.7		23	14,089	-61.8		27	13,953	-57.3		25	13,778	-51.0		24	13,943	-57.3		22	13,759	-53.3		27	14,107	-62.1	
125	27	15,168	-61.9		22	15,212	-65.7		26	15,109	-58.4		25	14,961	-51.6		22	15,082	-58.4		20	14,925	-53.2		26	15,223	-64.5	
100	26	16,536	-64.8		19	16,548	-69.5		25	16,501	-59.6		23	16,403	-52.0		21	16,470	-60.7		17	16,365	-53.3		25	16,585	-64.9	
80	24	17,909	-61.9		15	17,883	-67.8		23	17,897	-58.0		23	17,846	-52.3		17	17,846	-59.4		14	17,784	-53.8		20	17,948	-63.2	
60	18	19,699	-57.6		10	19,651	-60.3		14	19,713	-55.5		18	19,698	-52.5		14	19,668	-56.8		9	19,624	-53.2		13	19,758	-58.8	
50	10	20,843	-55.8		5	20,829	-56.6						8	20,882	-51.5		10	20,825	-55.3		6	20,810	-52.7					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JUNE 1951

Standard pressure surface (mb.)	HATTERAS, N. C. (1015 MB.)				HAVANA, CUBA (1010 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (970 MB.)				JOLIET, ILL. (992 MB.)				LAKE CHARLES, LA. (1014 MB.)				LANDER, WYO. (829 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	3	22.7	88	30	49	25.2	82	30	9	25.4	71	29	361	13.9	75	30	179	17.4	81	30	5	25.3	85	30	1,696	13.2	54
1,000	30	133	22.9	81	30	139	25.5	79	30	128	23.9	72	29	104			30	112			30	124	25.7	80	30	78		
950	30	584	20.8	72	30	598	24.2	65	30	581	20.1	77	29	542			30	556	18.3	68	30	579	23.6	73	30	527		
900	30	1,047	18.2	69	30	1,063	21.7	62	30	1,039	16.8	81	29	996	12.3	63	30	1,015	15.5	66	30	1,047	21.4	64	30	996		
850	30	1,535	15.4	66	30	1,557	18.4	64	30	1,525	13.9	82	29	1,473	8.9	68	30	1,498	12.9	63	30	1,541	18.9	58	30	1,478		
800	30	2,048	12.5	63	30	2,075	15.3	59	30	2,035	11.9	75	29	1,972	5.3	71	30	2,006	10.4	59	30	2,059	16.1	55	30	1,991	12.5	47
750	30	2,594	9.3	57	30	2,623	12.1	54	30	2,586	11.1	42	28	2,500	1.9	72	30	2,548	7.6	57	30	2,609	13.1	48	30	2,530	8.7	49
700	30	3,156	6.1	54	30	3,194	8.6	55	30	3,149	9.2		29	3,049	- 1.2	68	30	3,106	4.5	57	30	3,183	10.2	41	30	3,095	4.3	54
650	30	3,764	2.4	53	30	3,807	4.9	50	29	3,764	6.1		29	3,643	- 4.5	64	30	3,711	1.0	54	30	3,799	6.2	43	30	3,693	- 0.1	57
600	30	4,403	- 1.3	48	30	4,453	1.5	45	28	4,409	2.0		29	4,264	- 8.0	54	30	4,346	- 2.8	45	30	4,446	1.9	41	30	4,329	- 5.0	58
550	30	5,093	- 5.3	47	29	5,156	- 2.2	41	28	5,108	- 2.2		29	4,935	-12.0	43	29	5,032	- 7.2	43	30	5,145	- 2.7	41	30	5,008	- 9.9	54
500	30	5,834	- 9.9	37	30	5,900	- 6.7	37	28	5,857	- 7.0		29	5,658	-17.2	42	29	5,765	-12.2	41	30	5,890	- 7.4	41	30	5,735	-15.1	45
450	30	6,648	-15.0	35	30	6,726	-11.5	35	28	6,679	-12.3		29	6,433	-22.9	43	29	6,569	-17.8	40	30	6,712	-12.5	35	29	6,532	-20.6	35
400	30	7,520	-21.0	34	29	7,612	-17.7		28	7,561	-18.5		29	7,292	-29.2	45	29	7,434	-23.8	42	30	7,592	-18.8	35	29	7,385	-27.0	34
350	30	8,493	-27.7	36	28	8,597	-24.6		28	8,542	-25.9		29	8,232	-36.2		29	8,396	-30.7	38	29	8,571	-26.1		29	8,333	-34.6	
300	29	9,581	-35.9		29	9,701	-32.6		28	9,639	-34.4		28	9,284	-44.1		29	9,472	-38.7		29	9,667	-34.4		29	9,390	-43.0	
250	29	10,821	-45.8		29	10,960	-42.4		28	10,888	-44.2		28	10,484	-51.7		29	10,700	-47.9		29	10,917	-43.9		28	10,590	-52.2	
200	29	12,271	-56.3		29	12,429	-54.4		27	12,351	-55.3		28	11,919	-53.9		29	12,141	-56.3		29	12,378	-55.1		28	12,015	-56.0	
175	29	13,111	-60.2		28	13,272	-60.8		27	13,191	-61.2		28	12,778	-52.8		29	12,984	-58.1		29	13,218	-60.8		28	12,865	-54.9	
150	29	14,066	-62.4		28	14,215	-67.1		27	14,135	-66.5		27	13,769	-52.4		29	13,952	-58.7		29	14,164	-65.5		27	13,846	-55.2	
125	28	15,185	-63.7		28	15,303	-71.2		26	15,224	-70.2		25	14,948	-52.8		27	15,104	-60.5		29	15,260	-69.7		26	15,006	-55.7	
100	26	16,542	-65.2		25	16,613	-73.7		25	16,544	-70.3		24	16,391	-53.0		25	16,484	-62.0		29	16,576	-72.7		26	16,421	-56.7	
80	24	17,909	-63.7		22	17,921	-71.5		23	17,875	-68.9		21	17,820	-53.8		25	17,866	-60.4		26	17,888	-70.9		21	17,838	-56.7	
60	18	19,707	-59.1		14	19,632	-66.3		20	19,617	-64.6		12	19,687	-52.8		13	19,693	-57.8		20	19,617	-64.0		15	19,666	-54.9	
50	12	20,860	-56.8		14	20,751	-60.9		20	20,741	-60.7						7	20,830	-55.7		16	20,748	-60.4		11	20,829	-53.6	
40	5	22,274	-54.2		13	22,153	-56.4		20	22,143	-56.3										12	22,143	-57.1		6	22,213	-52.4	
30					5	23,999	-53.1		18	23,984	-51.8																	
20									10	26,624	-48.2																	
15									6	28,494	-47.4																	

	LAS VEGAS, NEV. (931 MB.)				LITTLE ROCK, ARK. (1004 MB.)				MAZATLAN, MEXICO (1007 MB.)				MEDFORD, ORE. (967 MB.)				MERIDA, MEXICO (1009 MB.)				MIAMI, FLA. (1017 MB.)				NANTUCKET, MASS. (1014 MB.)			
SURFACE	30	660	31.2	9	30	79	24.2	82	30	14	27.9	73	30	401	24.6	30	30	27	28.9	69	30	4	25.8	77	30	14	13.6	92
1,000	30	8			30	111	24.5	79	30	73	27.2	73	30	101			30	107	28.3	69	30	151	26.0	73	30	128	15.7	84
950	30	475			30	569	23.7	73	30	530	23.9	61	30	556	23.8	29	30	567	25.9	68	30	604	23.3	71	29	568	16.0	72
900	30	959	29.9		30	1,033	20.8	72	30	999	23.6	50	30	1,020	20.1	32	30	1,036	22.8	70	30	1,073	20.5	69	30	1,023	13.9	63
850	30	1,464	25.6		30	1,526	17.9	68	30	1,496	21.3	55	30	1,510	16.0	38	30	1,533	19.6	72	30	1,566	17.3	67	30	1,504	11.2	62
800	30	1,991	20.9		30	2,043	14.9	64	30	2,020	18.7	55	30	2,021	12.1	43	30	2,053	16.2	74	30	2,081	14.2	61	30	2,008	8.5	61
750	30	2,545	15.9	18	30	2,595	12.0	55	30	2,578	15.9	48	30	2,564	8.1	45	30	2,603	12.9	71	28	2,623	11.1	58	30	2,546	5.8	58
700	30	3,123	10.7	24	30	3,162	8.8	50	30	3,154	12.5	45	30	3,124	4.7	39	30	3,177	9.9	58	29	3,197	7.7	54	29	3,100	3.2	48
650	30	3,739	5.3	30	30	3,776	5.0	44	30	3,777	8.4	49	30	3,728	1.1	28	30	3,796	6.7	50	29	3,807	4.3	51	29	3,699	0.1	47
600	30	4,382	- 0.2	34	30	4,419	0.7	41	30	4,429	3.9	53	30	4,363	- 2.8	25	30	4,443	3.4	43	29	4,452	0.8	44	28	4,335	- 3.1	41
550	30	5,074	- 5.2	33	30	5,117	- 4.1	41	30	5,130	- 1.0	51	30	5,047	- 7.1		30	5,148	- 0.5	42	28	5,147	- 3.1	40	28	5,023	- 6.9	
500	30	5,813	-10.4		30	5,857	- 9.0	37	30	5,883	- 6.2	46	30	5,783	-12.3		30	5,900	- 4.9	40	29	5,894	- 7.5	38	28	5,756	-11.4	31
450	30	6,621	-16.1		30	6,676	-14.4	35	30	6,708	-11.0		29	6,589	-17.8		30	6,728	- 9.9	35	29	6,711	-12.6	35	28	6,558	-16.7	
400	30	7,492	-22.8		30	7,547	-20.4		30	7,596	-16.8		29	7,455	-24.5		30	7,622	-15.8		29	7,597	-18.6	31	27	7,426	-23.0	
350	29	8,453	-30.7		30	8,521	-27.6		26	8,580	-24.0		29	8,412	-32.2		30	8,613	-22.9		29	8,579	-25.6		27	8,390	-30.1	
300	29	9,528	-39.1		30	9,612	-35.8		27	9,686	-32.1		29	9,480	-41.0		30	9,724	-31.1		29	9,678	-34.0		27	9,468	-38.5	
250	29	10,754	-48.2		30	10,854	-45.3		27	10,946	-41.9		29	10,693	-51.0		30	10,990	-41.0		29	10,931	-43.9		27	10,695	-47.8	
200	29	12,197	-55.6		30	12,309	-55.5		26	12,416	-53.9		28	12,120	-59.3		28	12,462	-53.7		29	12,391	-55.7		27	12,138	-56.2	
175	29	13,044	-57.2		30	13,150	-60.1		25	13,260	-60.5		28	12,954	-59.7		24	13,304	-60.8		29	13,229	-61.7		27	12,981	-58.7	
150	29	14,014	-58.9		30	14,106	-62.9		20	14,199	-66.8		28	13,918	-59.3		21	14,251	-67.6		28	14,171	-66.5		27	13,947	-59.2	
125	28	15,153	-60.3		27	15,224	-66.0		12	15,284	-72.3		27	15,059	-59.9		9	15,355	-72.7		26	15,267	-69.5		26	15,095	-59.6	
100	26	16,531	-62.8		27	16,566	-68.1		6	16,598	-75.8		25	16,457	-59.7		6	16,659	-75.6		22	16,591	-71.2		24	16,488	-61.7	
80	24	17,902	-62.1		23	17,919	-65.4		5	17,882	-73.3		24	17,850	-58.4		6	17,946	-75.4		15	17,924	-69.1		21	17,883	-59.7	
60	22	19,693	-58.4		13	19,703	-61.0						14	19,694	-56.7						11	19,668	-61.8		16	19,695	-55.9	
50	18	20,819	-55.3		5	20,853	-57.0						9	20,840	-55.7						8	20,810	-58.1		11	20,864	-54.7	
40	9	22,256	-53.6																									

	NASHVILLE, TENN. (994 MB.)				NORTH PLATTE, NEBR. (916 MB.)				OAKLAND, CALIF. (1013 MB.)				OKLAHOMA CITY, OKLA. (966 MB.)				OMAHA, NEBR. (977 MB.)				PHOENIX, ARIZ. (967 MB.)				PITTSBURGH, PA. (971 MB.)			
SURFACE	30	177	22.9	82	30	849	15.8	79	30	6	14.6	75	30	391	23.3	80	30	308	18.8	77	30	338	31.5	18	30	382	19.6	74
1,000	30	122			30	89			30	113	13.4	76	30	86			30	105			30	35			30	121		
950	30	577	23.0	68	30	535			30	556	14.7	65	30	541	23.4	73	30	551	18.3	69	30	501	32.4		30	573	19.8	69
900	30	1,042	20.1	68	30	996	15.8	71	30	1,007	18.4	37	30	1,010	21.5	69	30	1,010	15.7	69	30	982	28.7		30	1,032	17.2	68
850	30	1,533	16.8	67	30	1,480	13.8	67	30	1,495	17.3	25	30	1,504	19.0	67	30	1,494	13.0	69	30	1,485	24.4		30	1,518	13.9	71
800	30	2,048	13.6	63	30	1,990	11.4	66	30	2,010	14.4	22	30	2,023	16.4	60	30	2,002	10.9	60	30	2,010	19.7	15	29	2,028	11.1	59
750	30	2,594	10.4	56	30	2,530	8.7	62	30	2,555	11.0		29	2,579	13.5	55	30	2,545	8.4	53	30	2,568	14.9	17	29	2,571	8.1	56
700	30	3,160	6.9	54	30	3,096	5.4	58	30	3,123	7.3		30	3,148	10.0	47	30	3,105	5.1	53	30	3,137	10.0	21	29	3,131	4.9	49
650	30	3,768	3.2	50	30	3,699	1.6	55	30	3,733	3.5		30	3,764	6.0	42	30	3,713	1.9	46	30	3,756	5.9		27	3,735	1.5	42
600	30	4,408	- 0.7	45	30	4,339	- 2.8	55	30	4,373	- 0.5		30	4,411	1.2	39	30	4,349	- 2.0	40	30	4,397	1.3		28	4,372	- 2.3	40
550	30	5,100	- 5.1	40	30	5,026	- 7.6	56	30	5,063	- 5.2		30	5,104	- 4.1	36	30	5,038	- 6.6	32	30	5,096	- 3.6		26	5,057	- 6.3	
500	30	5,841	- 9.7	38	30	5,757	-12.7	52	30	5,804	-10.5		30	5,849	- 9.3		30	5,774	-11.9		30	5,836	- 9.0		26	5,795	-10.8	
450	30	6,653	-14.6	36	30	6,558	-18.2	48	30	6,611	-16.6		30	6,661	-14.8		30	6,577	-17.2		30	6,649	-15.1		26	6,603	-16.0	
400	30	7,530	-20.5	33	30	7,422	-24.4	47	30	7,481	-23.3		30	7,537	-21.2		30	7,446	-23.4		30	7,521	-21.9		26	7,474	-22.0	
350	30	8,504	-27.3	36	30	8,380	-31.6	49	29	8,438	-31.1		29	8,509	-27.9		29	8,408	-30.7		30	8,488	-29.3		26	8,441	-29.4	
300	30	9,596	-35.6	38	30	9,452	-39.6		28	9,505	-40.1		29	9,599	-35.6		30	9,485	-38.9		29	9,568	-37.5		25	9,519	-38.0	
250	30	10,838	-45.5		29	10,675	-48.9		27	10,724	-49.4		29	10,842	-44.7		30	10,712	-48.2		29	10,800	-46.7		25	10,749	-47.5	
200	30	12,290	-56.0		29	12,109	-57.4		26	12,161	-57.1		27	12,308	-54.4		30	12,152	-56.6		29	12,247	-55.4		25	12,193	-56.1	
175	30	13,130	-60.2		28	12,954	-57.8		26	13,001	-58.6		25	13,156	-58.8		30	12,995	-57.5		29	13,094	-57.4		25	13,036	-57.9	
150	30	14,084	-63.3		25	13,919	-58.4		26	13,969	-59.0		24	14,116	-62.1		29	13,961	-59.0		29	14,060	-60.7		23	13,988	-59.5	
125	28	15,196	-65.0		24	15,062	-58.6		26	15,109	-59.9		19	15,250	-66.2		24	15,100	-60.0		28	15,183	-63.6		22	15,122	-60.1	
100	25	16,549	-65.9		21	16,452	-59.8		25	16,501	-61.3		18	16,597	-68.4		25	16,488	-61.2		28	16,541	-66.2		20	16,509	-61.6	
80	22	17,905	-65.0		18	17,841	-59.6		24	17,883	-60.3		15	17,951	-65.3		23	17,878	-59.8		26	17,896	-65.4		18	17,887	-60.9	
60	21	19,679	-60.5		13	19,649	-56.9		18	19,700	-58.1		9	19,741	-60.0		17	19,717	-57.2		22	19,661	-59.6		15	19,684	-57.8	
50	16	20,836	-57.5		10	20,788	-55.1		12	20,863	-55.7						10	20,893	-55.5		21	20,810	-56.5		14	20,841	-56.1	
40	10	22,260	-54.7														5	22,295	-55.0		9	22,246	-54.2		11	22,280	-53.7	
30	5	24,123	-51.7																									

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Standard pressure surface (mb.)	PORTLAND, MAINE (1013 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (975 MB.)				SAN ANTONIO, TEX. (984 MB.)				SAN JUAN, P. R. (1015 MB.)				SANTA MARIA, CALIF. (1006 MB.)				S. STE. MARIE, MICH. (988 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	20	13.7	89	30	966	12.3	75	30	317	15.5	80	30	240	26.8	71	30	19	26.0	83	30	71	13.6	82	30	221	11.9	80
1,000	30	130	15.1	80	30	101			30	102			30	93			30	151	25.5	81	30	118	13.3	83	30	114		
950	30	569	15.1	68	30	544			30	543	16.2	69	30	553	24.9	73	30	600	22.8	80	30	559	13.3	76	30	553	14.4	65
900	30	1,022	12.8	70	30	1,001			30	999	13.7	67	30	1,022	22.7	74	30	1,071	19.9	79	30	1,008	17.8	44	30	1,003	12.2	63
850	30	1,500	10.2	69	30	1,484	12.3	59	30	1,478	10.5	71	30	1,519	20.1	73	30	1,563	17.0	74	30	1,498	18.1	26	30	1,480	9.5	63
800	30	2,002	7.3	64	30	1,990	8.9	61	30	1,981	7.3	72	30	2,040	17.8	57	30	2,079	14.9	61	30	2,013	14.7	28	30	1,981	6.8	61
750	30	2,536	4.5	57	30	2,526	5.4	66	30	2,516	4.2	68	30	2,598	15.8	43	30	2,625	12.2	51	30	2,562	11.4	28	30	2,512	3.9	56
700	30	3,091	2.1	50	30	3,081	1.9	64	30	3,068	1.1	62	30	3,174	12.5	37	30	3,199	8.9	52	30	3,128	8.2	21	30	3,067	1.1	51
650	30	3,691	- 1.0	43	30	3,684	- 1.8	60	29	3,668	- 2.1	53	30	3,795	8.4	38	29	3,811	5.2	50	30	3,738	4.2		30	3,666	- 2.2	44
600	30	4,321	- 4.7	44	30	4,309	- 5.8	53	30	4,294	- 5.5	48	30	4,448	3.7	39	29	4,458	1.8	45	30	4,382	- 0.1		30	4,292	- 5.7	41
550	30	5,007	- 8.4	42	30	4,992	-10.2	47	29	4,976	- 9.9	43	30	5,152	- 1.4	40	29	5,164	- 1.9	44	30	5,072	- 4.7		30	4,971	-10.1	36
500	30	5,734	-12.7	40	30	5,714	-15.0	41	29	5,700	-14.9	40	30	5,900	- 6.4	33	29	5,907	- 6.3	45	30	5,815	- 9.9		30	5,697	-14.7	32
450	30	6,534	-18.2	40	30	6,505	-20.5	38	29	6,494	-20.2	36	30	6,724	-11.4		29	6,734	-11.5	41	30	6,619	-16.0		30	6,491	-20.1	
400	30	7,400	-24.3	39	30	7,364	-26.9	39	29	7,351	-26.4	36	30	7,610	-17.7	34	28	7,618	-17.3	42	30	7,496	-23.0		30	7,350	-26.7	
350	30	8,359	-31.4		30	8,313	-33.9	40	29	8,302	-33.6		30	8,595	-24.8	34	28	8,604	-24.6	43	30	8,458	-30.7		30	8,300	-33.8	
300	30	9,432	-39.7		30	9,374	-42.1		29	9,366	-41.6		27	9,694	-33.1		27	9,706	-33.0	43	30	9,534	-39.2		30	9,362	-41.5	
250	28	10,653	-49.4		30	10,583	-50.8		29	10,579	-50.1		27	10,950	-42.5		22	10,964	-43.3		28	10,760	-48.4		29	10,574	-50.1	
200	28	12,086	-56.9		29	12,015	-56.6		29	12,014	-55.4		25	12,420	-53.8		25	12,427	-55.4		30	12,204	-56.1		29	12,009	-55.7	
175	27	12,933	-58.6		28	12,860	-55.5		29	12,866	-54.9		24	13,270	-59.4		24	13,266	-61.7		28	13,053	-58.4		29	12,857	-56.2	
150	26	13,900	-58.2		27	13,843	-54.8		28	13,855	-54.6		24	14,221	-65.1		25	14,206	-67.9		27	14,030	-60.1		29	13,837	-55.5	
125	25	15,046	-59.1		27	15,006	-55.4		27	15,023	-55.1		22	15,314	-69.0		25	15,288	-72.3		27	15,161	-62.0		29	14,996	-56.2	
100	22	16,441	-59.3		25	16,426	-56.1		26	16,444	-55.4		18	16,637	-73.2		22	16,596	-73.0		26	16,530	-63.3		28	16,408	-56.5	
80	19	17,836	-58.4		20	17,844	-56.2		23	17,867	-55.8		17	17,949	-69.1		18	17,906	-71.6		26	17,902	-62.4		27	17,821	-56.2	
60	13	19,639	-55.9		7	19,663	-54.3		12	19,732	-53.2		12	19,707	-60.9		13	19,626	-65.5		20	19,690	-59.1		21	19,650	-55.3	
50	9	20,802	-54.8						8	20,910	-53.1						9	20,758	-60.9		9	20,864	-56.3		17	20,813	-54.0	
40	5	22,257	-52.8														6	22,172	-56.4						11	22,262	-51.8	

Standard pressure surface (mb.)	SPOKANE, WASH. (931 MB.)				SWAN ISLAND, W. I. (1012 MB.)				TACUBAYA, MEXICO (773 MB.)				TAMPA, FLA. (1016 MB.)				TATOOSH ISLAND, WASH. (1015 MB.)				TOLEDO, OHIO (991 MB.)				WASHINGTON, D. C. (1005 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	722	18.7	42	30	10	26.8	85	30	2,306	18.2	65	30	9	26.0	78	30	31	11.2	90	30	191	18.9	78	30	88	20.1	84
1,000	30	103			30	115	26.7	82	30	35			30	148	25.4	77	30	155	11.1	86	30	113			30	132	21.2	78
950	30	553			30	575	23.7	81	30	500			30	604	23.3	67	30	588	12.9	67	30	561	18.5	64	29	582	20.3	68
900	30	1,013	16.6	42	30	1,039	20.7	78	30	981			30	1,070	20.6	63	30	1,039	12.3	51	30	1,020	16.2	64	30	1,043	17.3	71
850	30	1,497	12.6	45	30	1,532	17.9	74	30	1,479			30	1,562	17.3	64	30	1,516	10.4	48	30	1,504	13.0	67	30	1,529	14.3	71
800	29	2,000	8.4	52	30	2,049	15.3	68	30	2,013			30	2,077	14.3	61	30	2,018	7.3	47	30	2,012	10.8	55	30	2,040	11.5	64
750	29	2,532	4.2	55	30	2,595	12.4	61	29	2,570	16.3	66	30	2,623	11.2	56	30	2,548	4.0	47	30	2,555	8.3	48	30	2,582	8.3	62
700	29	3,086	- 0.2	57	30	3,170	9.2	58	30	3,146	12.1	70	30	3,194	7.9	55	30	3,104	0.9	40	30	3,116	5.2	48	30	3,144	5.1	56
650	29	3,676	- 4.3	54	30	3,782	5.7	57	30	3,771	7.7	76	30	3,807	4.3	53	30	3,698	- 2.1	33	30	3,723	1.6	50	30	3,751	1.6	46
600	29	4,301	- 8.3	49	30	4,433	2.3	56	30	4,423	3.3	79	30	4,449	0.6	47	30	4,327	- 6.0	33	30	4,359	- 1.9	49	30	4,386	- 2.1	43
550	29	4,973	-12.3	44	30	5,128	- 1.7	56	29	5,126	- 1.0	73	30	5,146	- 3.3	45	30	5,002	-10.4	36	30	5,047	- 6.6	49	30	5,075	- 6.1	42
500	29	5,694	-16.9	41	30	5,884	- 6.0	48	28	5,881	- 5.2	58	30	5,890	- 7.5	39	29	5,730	-15.0	38	28	5,785	-11.1	46	30	5,812	-10.7	42
450	28	6,477	-22.5		29	6,705	-10.9	47	28	6,712	- 9.9	47	30	6,710	-12.4	37	29	6,517	-20.6	36	28	6,594	-16.2		30	6,623	-15.6	37
400	29	7,330	-29.0	38	30	7,599	-16.4	44	28	7,603	-15.8	44	30	7,595	-18.2	36	29	7,380	-27.2	38	28	7,465	-21.9		30	7,494	-21.5	36
350	29	8,269	-36.6		30	8,590	-23.3	39	26	8,595	-22.9	41	29	8,578	-25.1	32	28	8,328	-34.5	35	27	8,433	-29.3	38	30	8,464	-28.8	
300	28	9,316	-44.6		30	9,699	-31.5		24	9,708	-31.3		29	9,679	-33.4		28	9,387	-43.1		28	9,515	-37.5		30	9,548	-37.0	
250	28	10,516	-51.3		30	10,963	-41.7		23	10,974	-41.4		29	10,934	-43.3		28	10,590	-52.1		28	10,749	-47.2		30	10,783	-46.7	
200	28	11,956	-52.9		29	12,436	-54.1		21	12,449	-54.0		28	12,398	-55.0		26	12,012	-58.4		28	12,192	-56.5		30	12,230	-56.1	
175	27	12,828	-52.3		28	13,279	-60.7		15	13,293	-60.8		28	13,238	-60.8		26	12,853	-57.5		26	13,021	-58.3		30	13,072	-58.9	
150	26	13,831	-52.9		28	14,221	-67.6		7	14,249	-67.8		28	14,184	-65.6		26	13,828	-56.4		25	13,996	-59.0		30	14,032	-61.4	
125	24	15,016	-53.8		25	15,302	-72.9						27	15,284	-68.6		25	14,990	-56.4		25	15,135	-60.6		29	15,165	-62.9	
100	21	16,444	-53.2		23	16,595	-75.3						24	16,615	-70.4		23	16,408	-55.9		25	16,520	-61.6		28	16,529	-63.7	
80	16	17,881	-52.7		20	17,897	-72.3						21	17,945	-67.5		19	17,824	-54.8		23	17,908	-60.1		25	17,905	-62.3	
60	9	19,745	-52.6		13	19,614	-64.7						17	19,699	-60.7		9	19,662	-53.7		16	19,727	-56.9		21	19,702	-58.5	
50	5	20,934	-51.7		13	20,738	-59.6						14	20,833	-56.9		6	20,828	-52.8		7	20,905	-55.3		20	20,848	-55.9	
40					8	22,144	-54.8						6	22,229	-53.4										20	22,276	-53.0	
30																									19	24,142	-50.2	
20																									16	26,806	-46.6	
15																									6	28,722	-44.5	

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

JUNE 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	166	5.5	30	235	2.7	30	265	2.6	29	344	1.9	29	243	1.5	30	306	4.1
500	--	---	----	--	---	----	30	257	2.8	--	---	----	--	---	----	--	---	----
1,000	29	174	8.8	--	---	----	30	262	3.9	--	---	----	28	227	2.9	30	306	4.5
1,500	29	180	8.2	--	---	----	30	271	4.2	29	318	2.2	26	244	3.8	30	308	5.0
2,000	27	196	7.3	30	243	3.8	27	274	5.8	28	284	.9	23	247	3.7	30	312	4.7
2,500	24	221	6.2	30	233	4.0	18	278	7.1	26	275	2.9	20	272	5.6	30	303	4.8
3,000	22	238	7.3	30	235	6.0	13	275	6.6	23	269	5.7	18	269	6.8	29	302	5.6
4,000	20	247	8.6	30	245	8.4	11	289	8.9	20	263	8.6	10	268	5.3	29	296	7.5
5,000	17	263	9.3	27	256	10.7				16	266	11.0				26	295	9.6
6,000	16	281	11.1	26	253	13.9				12	264	13.9				26	286	11.8
8,000	12	279	11.7	22	255	16.5										25	299	16.2
10,000				21	259	23.3										21	306	20.0
12,000				18	256	29.6										10	297	16.1
14,000				12	251	30.9												
16,000																		

Altitude (meters) m.s.l.	Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	140	8.3	30	227	2.4	29	266	1.5	30	187	2.8	29	231	2.1	30	235	4.1
500	30	148	10.6	30	238	3.2	29	229	1.5	30	196	3.5	29	242	3.2	--	---	---
1,000	28	158	10.3	27	247	3.3	28	247	2.2	29	235	2.9	28	259	3.9	--	---	----
1,500	22	163	9.5	25	259	4.6	27	263	3.3	27	278	3.0	23	260	4.6	30	232	5.3
2,000	18	165	8.6	23	257	6.4	23	261	3.8	24	304	3.5	20	257	6.8	30	231	5.6
2,500	17	162	7.9	20	272	7.3	19	256	6.1	20	323	3.7	18	268	7.8	30	[illegible]	5.5
3,000	15	164	5.1	18	274	8.2	18	267	7.8	15	317	5.5	17	279	8.4	30	237	5.9
4,000	12	163	2.6	14	280	10.4	10	299	6.3	13	318	5.9	12	259	7.6	30	243	7.7
5,000				12	284	11.2				13	325	5.5				30	248	11.4
6,000										11	314	6.6				29	246	14.1
8,000																27	248	16.7
10,000																26	252	22.7
12,000																20	258	27.8
14,000																14	258	22.2
16,000																12	260	13.5

Altitude (meters) m.s.l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	248	1.8	30	283	3.2	27	210	1.3	30	321	1.3	30	126	2.4	28	278	1.5
500	--	---	----	--	---	----	27	217	1.4	--	---	----	30	168	2.7	28	281	1.8
1,000	--	---	----	--	---	----	26	227	2.7	30	321	2.0	30	239	2.6	26	259	2.8
1,500	--	---	----	30	277	3.0	26	255	3.4	28	304	2.4	30	273	3.3	21	252	4.2
2,000	30	250	2.2	30	281	4.2	23	276	4.7	26	283	3.6	25	305	2.5	15	242	5.2
2,500	30	242	3.0	30	270	4.9	20	279	6.6	19	273	5.2	23	331	3.1	12	260	5.6
3,000	30	245	3.3	29	257	5.8	17	293	6.3	14	270	5.9	19	7	2.5	10	253	7.2
4,000	28	261	4.3	28	242	8.0	15	297	6.2				17	1	4.3			
5,000	25	268	7.0	24	252	9.8	15	301	8.2				15	351	4.7			
6,000	18	278	8.0	21	260	12.9	13	302	8.7				12	10	4.5			
8,000				14	272	16.9												
10,000																		
12,000																		

Altitude (meters) m.s.l.	Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	190	1.6	30	199	2.4	30	306	2.2	30	137	4.7	28	198	3.9	30	261	1.7
500	--	---	----	30	209	4.3	30	310	2.3	30	139	5.6	28	210	4.7	30	246	3.7
1,000	30	196	3.2	27	224	5.6	30	318	2.8	30	137	2.9	26	232	4.2	28	245	4.7
1,500	30	204	3.7	24	229	7.5	30	318	2.6	30	115	.6	21	263	4.5	23	251	6.7
2,000	30	202	3.9	21	243	8.2	30	310	1.8	29	330	1.2	17	266	3.8	20	255	6.6
2,500	30	214	4.5	19	248	7.5	30	284	1.4	25	305	2.2	13	281	4.1	19	260	7.0
3,000	30	214	5.1	15	247	8.8	30	302	2.0	24	296	2.0	10	286	4.4	17	266	5.2
4,000	29	236	4.6				29	327	4.5	19	287	2.9				13	282	6.5
5,000	29	263	6.0				29	318	6.5	12	308	2.3				10	282	9.4
6,000	25	265	8.3				28	311	9.2	11	288	2.6						
8,000	18	266	12.9				23	312	11.7									
10,000							17	307	13.6									
12,000							11	316	11.4									

Altitude (meters) m.s.l.	New York, N.Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	25	138	1.6	29	283	5.0	30	170	3.6	30	360	0.2	30	233	2.0	29	353	1.9
500	25	228	1.8	27	278	4.0	30	173	4.2	30	246	.4	30	235	3.0	--	---	----
1,000	25	271	3.0	27	272	2.1	30	178	5.0	27	226	1.3	30	228	4.1	29	353	1.9
1,500	23	298	3.9	27	296	1.8	27	199	6.4	24	241	2.9	30	218	4.4	29	336	2.5
2,000	18	296	5.4	28	319	1.7	26	218	6.9	19	259	4.1	30	209	4.3	28	267	1.5
2,500	13	301	5.7	28	339	1.8	25	230	8.0	17	259	5.9	30	213	4.6	26	290	3.2
3,000	12	300	6.1	28	346	2.1	24	244	8.5	16	258	7.5	30	223	4.9	17	278	8.1
4,000	11	303	8.4	25	327	2.1	22	255	12.2	12	259	10.8	29	225	5.9			
5,000				25	305	3.0	19	270	12.5				28	235	8.4			
6,000				21	303	4.5	19	275	15.0				28	247	9.0			
8,000				20	300	5.4	16	264	16.8				22	252	12.0			
10,000				14	275	7.9	12	257	21.5				17	257	16.1			
12,000				10	264	10.2							13	266	16.9			

Altitude (meters) m.s.l.	St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash.		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	27	250	1.0	30	178	0.9	29	145	4.9	29	262	4.1	27	297	2.0	30	278	3.1
500	27	250	1.7	30	206	1.1	29	142	5.9	28	272	3.0	27	283	2.2	30	295	1.8
1,000	27	241	1.9	27	234	3.1	29	154	6.4	26	229	1.2	27	273	2.1	28	312	1.3
1,500	26	264	2.2	26	254	5.2	28	166	6.9	25	254	1.2	23	279	2.6	26	331	1.9
2,000	24	267	3.6	24	266	6.8	23	179	6.8	24	257	1.7	20	288	2.5	23	344	2.2
2,500	18	279	5.2	18	264	9.8	19	188	5.2	24	234	1.9	19	293	4.1	23	324	2.7
3,000	15	283	5.5	18	266	10.9	18	193	3.9	24	221	2.4	17	303	4.7	23	305	3.8
4,000				10	262	10.8	13	270	3.0	19	241	5.4	13	301	7.1	22	317	8.7
5,000							10	316	4.6	18	244	7.7	11	300	7.8	19	311	13.3
6,000							10	303	6.0	17	242	7.8	10	295	7.5	17	310	14.8
8,000										13	246	10.5				15	308	19.0
10,000																		
12,000																		

Altitude (meters) m.s.l.	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	222	1.7	28	243	0.4
500	--	---	----	28	239	1.5
1,000	30	259	1.6	27	260	2.3
1,500	28	266	2.0	25	283	4.2
2,000	25	272	2.0	22	300	5.6
2,500	24	274	2.7	22	304	7.3
3,000	21	278	3.9	19	302	7.8
4,000	12	304	7.4	14	295	8.9
5,000				13	300	10.9

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	181	1.3	30	146	5.4	30	137	0.7	30	127	6.2	30	197	2.7	30	258	1.2
500	--	---	----	--	---	----	--	---	----	30	142	10.1	30	194	3.6	30	267	1.9
1,000	--	---	----	30	156	8.3	29	216	.8	30	149	9.8	30	209	2.2	30	281	2.4
1,500	--	---	----	30	175	9.7	29	271	2.2	30	153	9.1	30	215	.4	30	296	3.6
2,000	30	252	4.6	30	189	8.0	29	285	4.0	30	155	8.0	30	87	.6	30	292	4.2
2,500	30	252	5.8	30	200	6.4	29	292	4.7	30	154	6.4	30	114	.7	30	292	4.7
3,000	30	253	6.6	30	231	5.2	29	290	5.7	30	146	4.4	30	139	.9	30	282	6.6
4,000	30	246	7.9	28	264	7.3	29	282	7.3	30	135	3.2	30	297	.6	30	283	8.4
5,000	26	246	8.8	28	271	9.1	30	279	8.0	30	114	1.4	30	299	2.8	30	282	11.1
6,000	26	246	10.6	28	271	10.5	30	272	11.6	30	141	.6	30	303	4.8	30	285	14.1
8,000	25	259	17.4	25	264	15.8	29	272	15.8	30	299	3.6	30	298	7.8	28	283	17.6
10,000	23	260	24.4	25	258	21.0	26	266	20.9	29	279	7.9	30	293	11.0	27	281	21.8
12,000	13	260	26.9	20	260	25.8	20	272	19.1	27	283	10.1	30	298	14.3	24	280	17.4
14,000				14	267	23.8	15	260	14.5	24	299	10.6	28	304	14.7	22	286	14.5
16,000							14	261	10.5	21	316	2.2	26	313	4.9	20	281	10.5
18,000										15	76	3.5	21	95	3.6	14	285	7.6
20,000																		

Altitude (meters) m.s.l.	Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	214	1.8	30	137	0.8	30	342	1.6	30	218	0.9	30	179	1.4	29	137	0.7
500	30	220	4.0	30	178	1.6	--	---	----	29	209	2.1	30	226	2.9	27	216	.5
1,000	30	251	3.1	30	221	2.9	--	---	----	28	236	2.8	30	265	2.4	27	272	2.2
1,500	30	287	2.6	30	235	5.1	30	340	1.7	28	266	3.3	30	301	3.6	27	283	3.2
2,000	30	305	2.7	30	248	6.3	30	292	4.1	27	277	4.0	30	298	3.7	27	282	3.5
2,500	30	320	3.2	30	261	7.0	30	288	4.9	28	281	3.7	30	300	4.1	27	274	4.5
3,000	30	317	3.7	30	266	8.3	30	277	5.2	28	284	3.8	30	302	4.7	28	265	6.4
4,000	30	319	4.0	30	268	10.9	30	253	6.7	28	299	5.8	29	321	4.9	28	268	7.9
5,000	30	322	5.1	30	273	11.5	30	246	9.3	27	303	6.7	28	307	5.6	29	266	10.9
6,000	30	303	5.9	30	272	12.9	29	247	11.1	27	297	10.0	28	304	6.6	29	268	13.3
8,000	29	289	8.6	30	267	17.2	28	259	13.3	28	290	12.6	26	296	11.5	29	258	20.1
10,000	29	296	11.3	28	256	19.2	21	267	14.1	27	286	16.0	22	300	13.0	27	256	26.3
12,000	26	299	12.9	27	258	24.5	16	266	17.4	25	281	19.8	20	297	16.7	19	259	20.7
14,000	24	303	11.9	23	262	21.9	12	259	11.1	23	282	17.6	20	301	14.5	18	268	14.3
16,000	18	300	7.7	15	260	12.5				21	296	8.1	17	333	6.1	16	269	7.5
18,000	14	50	2.5							16	267	2.3	14	325	2.6	11	266	5.5
20,000	10	77	6.2							10	71	3.6	10	42	6.5			

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	203	0.9	30	344	5.4	30	106	0.6	30	97	0.3	30	182	1.0	30	282	4.9
500	29	204	5.0	30	343	5.7	30	162	1.9	30	287	1.8	30	214	2.5	30	284	5.7
1,000	29	218	5.9	30	340	6.1	30	161	1.5	30	315	2.2	30	226	4.2	30	288	5.5
1,500	28	229	6.1	30	335	4.6	30	131	1.1	30	309	3.1	30	237	5.5	30	310	3.9
2,000	28	242	5.8	30	313	3.0	30	108	.7	30	301	3.9	30	249	5.3	30	333	3.1
2,500	28	254	5.9	30	308	2.5	30	345	.5	30	304	4.3	30	263	5.4	30	350	3.0
3,000	29	270	6.9	30	297	2.3	30	312	.8	30	305	5.3	30	270	5.9	30	352	2.7
4,000	30	286	8.3	30	321	4.7	29	347	1.4	30	290	7.0	30	279	6.8	30	322	3.5
5,000	30	288	10.2	30	319	7.9	29	346	2.4	29	286	9.1	30	286	8.9	30	325	5.1
6,000	29	295	10.8	30	320	10.2	29	330	3.8	28	289	11.1	29	286	9.5	30	324	6.6
8,000	29	274	13.7	26	317	12.2	29	329	5.8	27	282	14.7	29	278	13.6	28	322	6.7
10,000	29	271	17.2	26	319	15.0	28	332	8.0	26	283	18.0	29	263	16.0	27	311	9.7
12,000	25	267	18.0	25	311	15.4	28	319	8.4	25	282	22.2	27	267	20.2	24	284	12.6
14,000	24	279	17.7	22	298	12.4	27	326	10.4	20	290	23.0	26	274	16.7	15	266	14.3
16,000	20	261	11.1	12	303	8.4	19	349	6.6	15	305	15.7	22	294	11.8			
18,000	14	246	1.7				13	88	5.4				17	289	3.8			
20,000													12	91	3.4			

Altitude (meters) m.s.l.	Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	146	3.8	30	359	2.1	30	128	5.7	30	132	3.8	30	29	0.3	30	274	4.3
500	28	154	5.2	--	---	----	30	136	9.0	30	97	8.3	28	198	.2	30	314	3.3
1,000	28	175	8.2	30	358	2.2	30	157	10.0	30	100	9.2	28	258	1.7	30	327	3.3
1,500	28	195	7.9	30	336	1.8	30	167	7.9	30	103	9.2	28	255	3.2	30	4	2.7
2,000	28	219	7.4	30	318	2.1	30	172	6.8	30	101	8.6	29	263	4.2	30	28	2.3
2,500	28	229	7.3	30	299	3.2	30	176	5.3	30	101	8.0	30	268	5.2	30	353	1.3
3,000	29	241	7.4	30	288	4.9	30	181	3.8	30	105	7.7	30	275	6.0	30	308	2.0
4,000	28	268	8.3	30	278	8.9	30	222	1.4	29	102	5.9	30	264	9.3	30	319	3.5
5,000	28	275	11.0	30	[illegible]	14.7	30	296	1.9	29	113	4.8	29	268	11.4	30	302	4.2
6,000	28	276	12.5	29	268	16.8	30	289	3.6	29	134	4.1	28	267	13.4	30	301	5.1
8,000	27	265	17.5	26	259	18.4	30	269	9.0	27	182	3.9	26	267	15.0	30	286	7.1
10,000	25	260	22.3	25	245	23.1	26	267	16.1	26	232	4.9	25	257	23.3	29	270	9.2
12,000	21	268	24.9	22	241	26.9	23	267	21.0	24	261	9.2	21	261	22.7	29	272	12.0
14,000	15	264	23.7	12	268	17.0	17	272	16.1	24	265	9.9	14	275	16.8	26	261	11.5
16,000	14	253	13.1				14	273	8.9	25	264	5.5	14	276	10.3	26	258	8.5
18,000	13	238	8.4							16	85	4.1	12	304	3.8	25	294	2.9
20,000										11	88	9.6				10	88	5.1

Altitude (meters) m.s.l.	Sault Ste. Marie Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	27	270	1.0	30	266	0.4	30	203	4.8
500	27	282	1.6	--	---	----	30	272	4.9
1,000	26	251	1.4	30	292	.7	30	291	4.1
1,500	26	264	3.1	30	299	1.5	30	306	3.4
2,000	26	265	4.5	30	306	2.6	30	326	3.7
2,500	26	266	5.1	30	308	3.4	30	329	4.9
3,000	26	268	5.9	30	316	5.1	30	327	6.6
4,000	25	262	8.3	30	318	7.1	30	319	9.0
5,000	25	263	10.9	28	317	9.3	30	317	12.3
6,000	25	266	13.0	28	313	12.0	27	315	14.9
8,000	22	267	18.8	27	305	15.5	22	320	17.5
10,000	16	272	21.9	23	313	17.9	17	317	19.5
12,000				16	311	20.1	11	305	19.2
14,000				14	304	13.6			
16,000				11	307	10.4			

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°,E = 90°,S = 180°,W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30.--Solar radiation intensities, tabulated in langleys per minute.

JUNE 1951

Date	Sun's zenith distance									Vapor pressure, E.S.T	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
MADISON, WISCONSIN											
	Air mass										
	4.81	3.84	2.88	1.92	0.96	1.92	2.88	3.84	4.81		
June										Mb.	Mb.
5-----	----	----	0.80	1.04	1.30	----	----	----	----	9.8	9.4
7-----	.50	.59	.75	----	----	----	----	----	----	10.6	13.7
9-----	.35	.44	.59	.71	----	----	----	----	----	13.2	18.3
12----	.40	.52	.69	.94	1.28	----	----	----	----	15.3	15.3
14----	.36	.44	.59	.91	1.20	----	----	----	----	14.2	12.3
18----	----	----	.43	.59	----	----	----	----	----	18.3	19.6
25----	.77	.87	.94	1.04	1.27	----	----	----	----	13.7	15.3
29----	.69	---	----	----	----	----	----	----	----	11.8	12.3
30----	----	.77	.95	1.13	1.32	----	----	----	----	13.7	12.3
Averages	.51	.61	.72	.91	1.27	----	----	----	----		
Departures	-.11	-.14	-.16	-.12	-.04	----	----	----	----		
LINCOLN, NEBR.											
	Air mass										
	4.77	3.81	2.86	1.91	0.95	1.91	2.86	3.81	4.77		
June										Mb.	Mb.
16----	----	----	----	----	1.29	0.97	----	----	----	19.6	21.8
27----	----	----	----	----	1.27	.92	.77	.62	.54	19.6	24.2
Averages	----	----	----	----	1.28	.95	.77	.62	.54		
Departures	----	----	----	----	-.07	-.13	-.13	-.15	-.11		
TABLE MOUNTAIN, CALIF.											
	Air mass										
	3.76	3.01	2.26	1.51	0.75	1.51	2.26	3.01	3.76		
June										Mb.	Mb.
2-----	----	----	----	1.35	----	----	----	----	----		
15----	----	----	----	1.25	----	----	----	----	----		
16----	----	----	----	1.28	----	----	----	----	----		
17----	----	----	----	1.33	----	----	----	----	----		
20----	----	----	----	1.38	----	----	----	----	----		
21----	1.06	1.15	1.25	1.38	----	----	----	----	----		
22----	----	----	----	1.32	----	----	----	----	----		
23----	----	----	----	1.43	----	----	----	----	----		
24----	1.07	1.16	1.27	1.44	----	----	----	----	----		
25----	1.14	1.23	1.32	1.46	----	----	----	----	----		
26----	1.17	1.25	1.34	1.47	----	----	----	----	----		
27----	1.18	1.26	1.35	1.47	----	----	----	----	----		
28----	----	----	----	1.46	----	----	----	----	----		
29----	----	----	----	1.46	----	----	----	----	----		
Averages	1.12	1.21	1.31	1.39	----	----	----	----	----		
Departures	+.03	+.03	+.03	.00	----	----	----	----	----		
BOSTON, MASS.											
	Air mass										
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
										Mb.	Mb
	NO DATA DURING JUNE 1951										

*Extrapolated

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
ALBUQUERQUE, N.M.											
	Air mass										
	4.08	3.26	2.44	1.63	*0.82	1.63	2.44	3.26	4.08		
June										Mb	Mb
1----	0.60	0.73	0.92	1.20	1.42	1.11	0.82	0.77	0.58	2.0	1.2
2----	.91	1.02	1.16	1.32	1.48	1.35	1.12	1.00	.94	3.5	1.7
3----	.60	.71	.89	1.16	1.40	----	----	----	----	5.2	4.0
4----	----	----	.80	1.09	----	1.05	----	----	----	7.0	5.0
5----	.66	.77	.94	1.15	1.37	----	----	----	----	8.5	3.3
6----	.75	.84	.95	1.23	1.45	1.27	----	.99	.89	3.8	1.5
7----	.91	1.00	1.13	1.29	1.45	1.36	1.23	1.09	1.02	1.6	1.2
8----	.79	.89	1.03	1.21	1.43	1.27	1.10	1.00	.91	1.9	1.2
9----	----	----	----	----	----	1.30	1.14	1.05	.99	1.5	2.9
10---	.99	1.07	1.22	1.38	1.54	1.23	.99	.86	.78	1.5	1.5
11---	.73	.82	1.01	1.22	1.46	----	----	----	.87	3.0	1.8
12---	.86	.96	1.11	1.29	1.47	1.24	1.14	.99	----	6.5	3.2
13---	.73	.82	.99	1.18	1.36	1.22	----	----	----	6.0	2.4
14---	.75	.87	1.02	1.18	1.48	----	----	----	----	4.0	1.9
15---	.76	.83	1.00	1.19	1.39	----	----	----	----	7.9	4.0
16---	.87	.95	1.09	1.26	1.52	1.30	1.14	1.00	.92	5.0	3.5
17---	----	----	----	----	----	1.31	1.15	1.07	1.04	2.9	2.9
18---	.65	.76	.96	1.17	1.43	1.26	----	----	----	3.0	1.9
19---	.41	.91	1.03	1.22	1.43	----	----	----	----	3.6	3.8
22---	.97	1.04	1.18	1.34	1.52	1.37	1.23	1.06	.97	1.9	1.3
23---	1.07	1.14	1.27	1.41	1.53	1.49	1.34	1.25	1.18	1.1	1.2
24---	.71	.80	.98	1.22	1.51	1.35	1.16	1.04	.94	9.1	.9
25---	1.00	1.10	1.21	1.37	1.55	1.18	.85	.66	.48	1.5	2.1
26---	.77	.89	1.02	----	1.39	----	----	----	----	2.0	5.4
27---	.90	.98	1.12	1.31	1.41	1.40	1.26	1.15	1.09	6.0	1.1
28---	.95	1.01	1.15	1.30	1.49	1.38	1.22	1.08	1.01	1.6	1.5
29---	.76	.79	.94	1.17	1.42	----	----	----	----	2.1	1.4
30---	.78	.88	1.03	1.23	----	----	.93	----	----	8.5	6.8
Averages	.80	.90	1.04	1.24	1.45	1.29	1.11	1.00	.91		
Departures	-.01	.00	+.01	+.05	+.01	+.06	.00	.00	.00		
BLUE HILL, MASS.											
	Air mass										
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
June										Mb	Mb
6----	----	----	----	----	----	1.03	0.87	0.73	0.64	14.3	10.9
7----	.65	.75	.88	1.02	----	----	----	.78	.70	10.8	8.6
8----	.78	.86	.99	1.16	----	----	----	----	----	10.1	8.5
9----	.44	.50	.64	.87	1.25	----	----	----	----	13.3	13.8
12---	----	----	----	----	----	1.13	.94	.81	.71	9.6	9.7
13---	.75	.86	----	----	----	----	----	----	----	11.2	13.0
18---	----	----	----	----	----	.65	.40	----	----	17.8	18.6
24---	----	----	----	----	1.33	----	----	----	----	18.3	20.6
25---	----	----	----	----	----	1.17	1.03	.89	.80	22.4	16.5
26---	.90	.99	1.09	1.22	1.46	----	----	----	----	10.4	9.3
Averages	.70	.79	.90	1.07	1.35	1.00	.81	.80	.71		
Departures	+.05	+.04	+.01	+.02	+.04	-.04	-.04	+.10	+.12		
TACUBAYA, D. F., MEXICO											
	Air mass										
	3.83	3.07	2.31	1.53	0.77	1.53	2.31	3.07	3.83		
June										Mb	Mb
4----	----	----	----	0.85	----	----	----	----	----	12.1	13.6
6----	.63	.72	----	----	----	----	----	----	----	12.0	13.1
8----	----	----	.93	.92	----	----	----	----	----	12.3	11.9
11---	----	.74	----	.91	----	----	----	----	----	12.1	10.5
12---	----	----	----	.70	----	1.01	.90	----	----	12.3	9.3
13---	.63	.70	----	.97	----	----	----	----	----	10.7	8.5
14---	----	----	----	.98	----	----	----	----	----	10.8	10.7
15---	----	----	----	.85	----	----	----	----	----	12.7	11.2
16---	.62	.72	----	.92	----	----	----	----	----	12.1	10.3
18---	.55	.59	----	.94	----	----	----	----	----	13.7	12.7
19---	----	----	----	----	----	1.13	.92	.75	.67	10.0	9.6
20---	----	----	----	----	----	.87	.75	----	----	10.1	7.3
21---	.22	.30	----	.75	----	----	.68	----	.34	10.9	6.8
22---	.23	.37	----	.76	----	.77	----	----	----	10.8	7.9
30---	----	----	----	.86	----	----	----	----	----	13.2	13.3
Averages	.48	.59	.93	.87	----	.94	.81	.75	.51		
Departures	----	----	----	----	----	----	----	----	----		

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	4	5	6	7	8	9	10	Average	11	12	13	14	15	16	17	Average	18	19	20	21	22	23	24	Average
Langleys	224	84	301	---	---	243	223	215	131	241	194	29	14	102	157	124	233	237	243	201	233	69	230	207
Date	25	26	27	28	29	30	1	Average																
Langleys	222	228	72	154	127	180	75	151																

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	4	5	6	7	8	9	10	Average	11	12	13	14	15	16	17	Average	18	19	20	21	22	23	24	Average
Langleys	160	89	180	198	188	146	149	159	137	167	180	51	33	111	145	118	186	175	181	159	167	90	170	161
Date	25	26	27	28	29	30	1	Average																
Langleys	174	173	116	164	119	158	92	142																

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	4	5	6	7	8	9	10	Average	11	12	13	14	15	16	17	Average	18	19	20	21	22	23	24	Average
Langleys	291	140	225	239	202	192	302	227	262	193	269	95	61	181	275	191	251	---	---	287	301	148	163	230
Date	25	26	27	28	29	30	1	Average																
Langleys	139	103	155	251	206	275	146	182																

Note.—Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33 –Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys

JUNE 1951

1951	Aklavik, Mackenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Bethel, Alaska	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Is., Pac.Area	Caribou, Me.	Charleston, S.C.	Cleveland, Ohio	Columbus, Ohio
June 4-------	478	572		683	634	292	511	217	422	511	664	68	699	302	
June 5-------	195	804		579	580	340	158	490	131	661	451	772	533	437	
June 6-------	341	853		679	661	347	681	360	655	678	(591)	573	328	768	
June 7-------	351	843		689	523	563	647	674	703	715	500	606	716	745	
June 8-------	420	835		715	527	543	748	774	685	687	637	295	469	324	
June 9-------	308	836		679	539	395	688	766	650	769	(361)	290	477	307	
June 10-------	301	851		536	758	583	496	684	633	760	265	826	763	536	
Averages------	342	799		651	603	438	561	566	554	683	(496)	490	569	489	
Departures----	-112	+33		+10	---	+27	+30	-57	+57	---	---	-18	+11	---	
June 11-------	352	760		675	732	238	300	488	339	730	(618)	703	708	750	
June 12-------	506	816		722	475	181	720	444	667	689	609	688	564	580	
June 13-------	340	809		697	609	510	572	645	575	651	280	723	533	118	
June 14-------	458	769		606	655	335	113	761	98	760	(552)	695	635	742	
June 15-------	692	642		416	340	535	71	783	69	759	541	291	524	781	
June 16-------	593	803		621	459	505	283	784	327	768	588	322	285	688	
June 17-------	656	781		304	425	596	413	779	397	757	396	550	279	680	
Averages------	514	769		577	528	415	353	669	353	730	(512)	567	504	620	
Departures----	+40	+3		-5	---	-31	-142	+4	-132	---	---	+31	-66	---	
June 18-------	665	784		185	572	384	638	770	676	768	581	703	540	679	
June 19-------	563	676		325	498	409	617	780	654	723	(598)	591	256	657	
June 20-------	602	489		561	527	485	630	785	680	633	(607)	614	597	502	
June 21-------	376	620		687	658	756	477	---	531	667	(665)	535	418	659	
June 22-------	596	842		514	801	(470)	613	---	590	719	355	718	683	479	
June 23-------	208	851		682	660	329	170	---	152	742	221	121	680	552	
June 24-------	445	824		700	---	770	759	---	719	744	(554)	401	652	585	
Averages------	494	726		522	619	(515)	558	---	572	714	---	526	547	587	
Departures----	-27	-30		-38	---	+64	+16	---	+95	---	---	+30	-61	---	
June 25-------	399	817		672	681	743	729	---	734	127	577	333	681	571	
June 26-------	665	787		662	572	188	743	---	729	590	(633)	586	683	439	
June 27-------	416	849		630	---	535	216	---	268	688	(633)	469	660	518	
June 28-------	224	827		663	---	250	386	---	344	743	641	494	630	(466)	
June 29-------	750	820		518	447	423	305	---	287	768	588	471	518	(742)	
June 30-------	410	740		591	366	100	420	---	542	756	(610)	291	613	169	
July 1-------	652	786		593	---	264	177	---	138	705	(225)	534	666	642	
Averages------	502	804		618	516	358	425	---	434	624	---	483	636	(507)	
Departures----	-23	+52		+78	---	-80	-86	---	-47	---	---	+2	+75	--	
Accumulated Departures January 1 to July 1, 1951	-42	+56		+560	---	-462	+2969	---	-581	---	---	---	---	---	

1951	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N.Y.	Keflavik, Iceland	Lake Charles, La.	Las Vegas, Nev.
June 4-------	691	214	492	438	669	641	440	687	744	612	817	617	603	588		717	232	831	194	526	197	720
June 5-------	627	280	175	163	792	615	508	317	780	503	637	730	303	508		758	583	800	452	449	630	757
June 6-------	699	585	705	667	819	620	618	694	785	474	822	695	538	730		745	556	824	763	624	683	746
June 7-------	693	585	489	710	811	752	646	634	789	512	431	706	449	577		750	311	837	778	320	693	739
June 8-------	704	183	707	549	821	501	771	560	762	610	497	462	398	504		718	489	830	716	113	708	717
June 9-------	677	221	632	705	820	565	671	699	758	726	817	602	404	585		724	222	836	464	(336)	733	739
June 10-------	681	579	423	730	797	748	676	653	747	462	795	---	461	748		730	679	766	87	815	709	757
Averages------	682	378	517	609	[illegible]	627	618	606	766	557	688	635	451	606		735	439	818	493	(454)	622	739
Departures----	+16	-84	-9	+68	+29	---	+105	+1	+76	+1	+62	+3	---	+29		+61	-107	+63	-39	---	+50	+6
June 11-------	651	533	378	651	[illegible]	680	430	447	700	353	810	514	531	778		741	683	816	332	416	675	654
June 12-------	679	332	637	668	799	477	442	328	756	465	644	483	451	476		768	356	798	685	145	501	766
June 13-------	643	282	576	634	784	658	444	731	536	626	724	535	388	459		710	398	828	77	615	536	746
June 14-------	679	630	100	689	823	796	422	633	719	543	856	406	603	(631)		590	685	706	78	120	454	744
June 15-------	672	649	106	756	815	802	606	654	717	367	762	742	554	282		442	719	814	553	668	512	701
June 16-------	709	523	322	486	815	568	511	690	741	353	756	512	458	516		566	518	787	---	826	604	720
June 17-------	681	596	413	641	812	457	591	771	729	272	---	625	189	451		578	---	800	---	826	570	702
Averages------	673	508	362	647	810	634	480	608	700	426	758	545	453	(513)		628	560	793	345	517	550	719
Departures----	-45	+81	-148	+128	+54	---	-33	-13	-11	-84	+86	-98	---	-72		+32	+23	+36	-153	---	-26	-29
June 18-------	676	527	654	569	804	672	409	554	742	266	---	(592)	146	749		751	---	798	---	822	650	740
June 19-------	618	257	651	463	771	736	449	600	467	163	---	747	641	611		751	---	725	744	818	713	503
June 20-------	[illegible]	416	643	542	588	405	504	755	701	637	---	345	556	514		562	661	810	486	743	629	758
June 21-------	675	328	581	445	765	508	606	649	[illegible]	[illegible]	---	670	582	731		[illegible]	[illegible]	757	749	156	647	754
June 22-------	713	64	557	610	797	674	674	740	753	514	---	330	570	701		450	511	777	228	178	684	761
June 23-------	676	454	270	287	803	806	233	763	743	619	---	707	651	683		632	(360)	813	---	787	673	791
June 24-------	668	447	652	697	803	707	765	764	755	344	---	792	657	457		660	(634)	---	---	833	398	684
Averages------	660	356	572	516	762	615	520	675	[illegible]	453	---	(597)	543	643		645	---	780	552	620	628	713
Departures----	-40	-113	+55	[illegible]	+21	---	-6	+32	[illegible]	-70	---	-39	--	[illegible]		+23	---	+6	[illegible]	---	+34	-41
June 25-------	696	672	628	697	786	[illegible]	726	(565)	[illegible]	579	---	809	599	703		686	748	831	---	807	646	777
June 26-------	670	434	712	562	786	[illegible]	717	765	755	568	---	834	579	682		789	474	843	683	824	652	786
June 27-------	698	426	242	438	779	786	778	759	772	551	---	750	538	671		770	445	841	648	655	488	773
June 28-------	703	265	300	493	771	715	417	776	788	467	---	(577)	617	558		704	406	860	693	283	404	775
June 29-------	734	653	298	555	787	817	163	777	790	536	---	685	577	309		689	380	831	312	187	481	772
June 30-------	653	538	461	556	749	869	572	709	782	300	---	847	554	498		371	184	832	259	151	659	717
July 1-------	739	561	247	388	744	724	417	619	773	509	---	701	616	444		633	706	853	310	261	406	772
Averages------	700	507	413	498	772	766	546	(710)	774	502	---	(743)	583	552		663	477	842	484	453	534	767
Departures----	-22	+16	-76	+60	+13	---	+79	+73	+55	[illegible]	---	+147	---	-48		+49	-59	+63	-25	---	-51	+46
Accumulated Departures January 1 to July 1, 1951	-1834	-4529	[illegible]	+1211	---	--	[illegible]	---	+4375	+1862	---	560	---	---		+1911	---	+1945	-98	---	+560	-574

Note.--Langley is the unit used to denote one gram calorie per square centimeter
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33 —Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys —Continued

1951	Lincoln, Nebr.	Little Rock, Ark.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Miami, Fla.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.
June 4	601	111	386	198	802	621	351	480		556
June 5	173	364	275	693	758	515	350	190		418
June 6	257	442	606	677	771	577	605	732		413
June 7	336	466	670	416	795	591	349	656		434
June 8	226	581	671	461	811	654	437	724		691
June 9	675	583	677	656	807	638	407	581		523
June 10	357	399	634	759	704	647	736	366		401
Averages	375	421	560	551	778	606	462	533		491
Departures	-137	---	+40	+32	+60	---	-85	+19		-22
June 11	231	453	380	591	737	747	738	243		278
June 12	693	429	648	608	756	674	225	769		395
June 13	566	710	552	665	711	649	651	547		345
June 14	319	290	115	715	776	518	642	105		368
June 15	677	339	58	571	782	581	647	86		651
June 16	633	360	318	525	814	677	457	371		714
June 17	586	707	383	684	821	617	572	600		695
Averages	529	470	351	623	771	638	562	389		492
Departures	-11	---	-195	+119	+87	---	+43	-124		+17
June 18	510	483	670	455	819	489	579	710		587
June 19	603	524	596	512	810	585	549	693		781
June 20	288	568	763	579	801	629	596	676		783
June 21	189	573	409	161	792	570	712	569		632
June 22	606	643	589	271	813	612	503	509		678
June 23	409	749	156	395	(803)	651	634	226		449
June 24	726	640	737	547	809	618	582	761		609
Averages	476	597	560	417	(809)	594	594	592		646
Departures	-88	---	+28	-111	+90	---	+45	+35		+137
June 25	528	655	676	651	796	603	573	703		431
June 26	292	800	758	401	780	627	677	783		424
June 27	695	671	243	331	784	498	656	259		680
June 28	351	652	313	451	773	---	226	334		777
June 29	452	398	323	607	770	673	524	325		753
June 30	571	427	459	693	773	719	302	339		341
July 1	372	118	142	730	827	435	373	195		443
Averages	466	532	373	552	786	593	476	420		550
Departures	-128	---	-162	+3	+18	---	-68	-119		+29
Accumulated Departures January 1 to July 1, 1951	-4928	---	---	-3080	+2422	---	+2730	-448		---

1951	Oak Ridge, Tenn.	Ottawa, Ontario	Pearl Harbor, T.H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S.D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste.Marie, Mich.
June 4	657	425	597	778	401	---	620	601	547	446	562	711
June 5	546	810	609	772	533	---	524	603	533	490	510	811
June 6	669	671	641	772	758	---	378	708	438	506	797	586
June 7	411	615	744	778	679	629	523	657	719	465	797	779
June 8	203	815	712	794	307	623	457	586	746	611	679	798
June 9	372	674	706	798	278	676	605	493	397	664	729	409
June 10	721	187	704	782	650	810	672	---	619	687	692	798
Averages	511	600	673	782	515	684	540	608	571	553	681	699
Departures	-13	+89	+54	+37	-61	+54	-12	---	+8	—	-4	+122
June 11	740	241	701	780	736	566	691	613	730	574	676	762
June 12	258	687	711	773	640	545	589	---	447	283	677	541
June 13	630	478	642	773	107	472	657	696	687	595	659	714
June 14	607	140	451	790	641	530	---	669	756	665	766	781
June 15	634	348	544	780	780	791	712	---	703	599	602	728
June 16	559	562	676	763	657	527	599	370	630	585	638	784
June 17	421	443	692	781	727	176	560	567	427	664	379	620
Averages	550	414	631	777	612	515	635	583	626	566	628	704
Departures	+19	-105	+80	+33	+70	-95	+39	---	+31	---	-5	+85
June 18	616	704	662	503	710	555	545	645	670	700	470	369
June 19	534	440	626	652	597	778	498	187	752	738	367	(569)
June 20	403	460	556	648	567	212	579	---	255	718	450	292
June 21	610	(542)	711	788	570	240	497	---	342	701	485	504
June 22	575	(283)	655	797	471	462	515	250	(566)	708	630	426
June 23	694	---	587	786	578	322	575	536	699	700	617	428
June 24	654	---	623	778	689	826	554	---	458	448	(306)	114
Averages	584	---	631	707	598	485	538	405	(534)	673	(475)	(386)
Departures	+34	---	+51	-26	+6	-135	-63	---	-60	---	-153	-160
June 25	598	792	640	776	700	614	533	71	(646)	410	601	715
June 26	517	(755)	503	774	411	779	709	743	703	646	680	158
June 27	653	578	444	806	(518)	419	706	194	707	739	690	753
June 28	329	(482)	493	792	544	399	723	751	723	611	722	425
June 29	342	437	497	698	710	782	675	---	710	727	713	378
June 30	300	179	293	640	227	631	703	---	672	693	626	797
July 1	365	418	708	766	676	648	633	---	682	615	583	678
Averages	443	520	511	750	(541)	610	669	440	(692)	635	659	558
Departures	-118	-35	-35	+50	-50	-50	+70	---	+84	---	-25	+25
Accumulated Departures January 1 to July 1, 1951	-955	+259	+3745	---	---	---	+2492	---	+1176	---	-1701	---

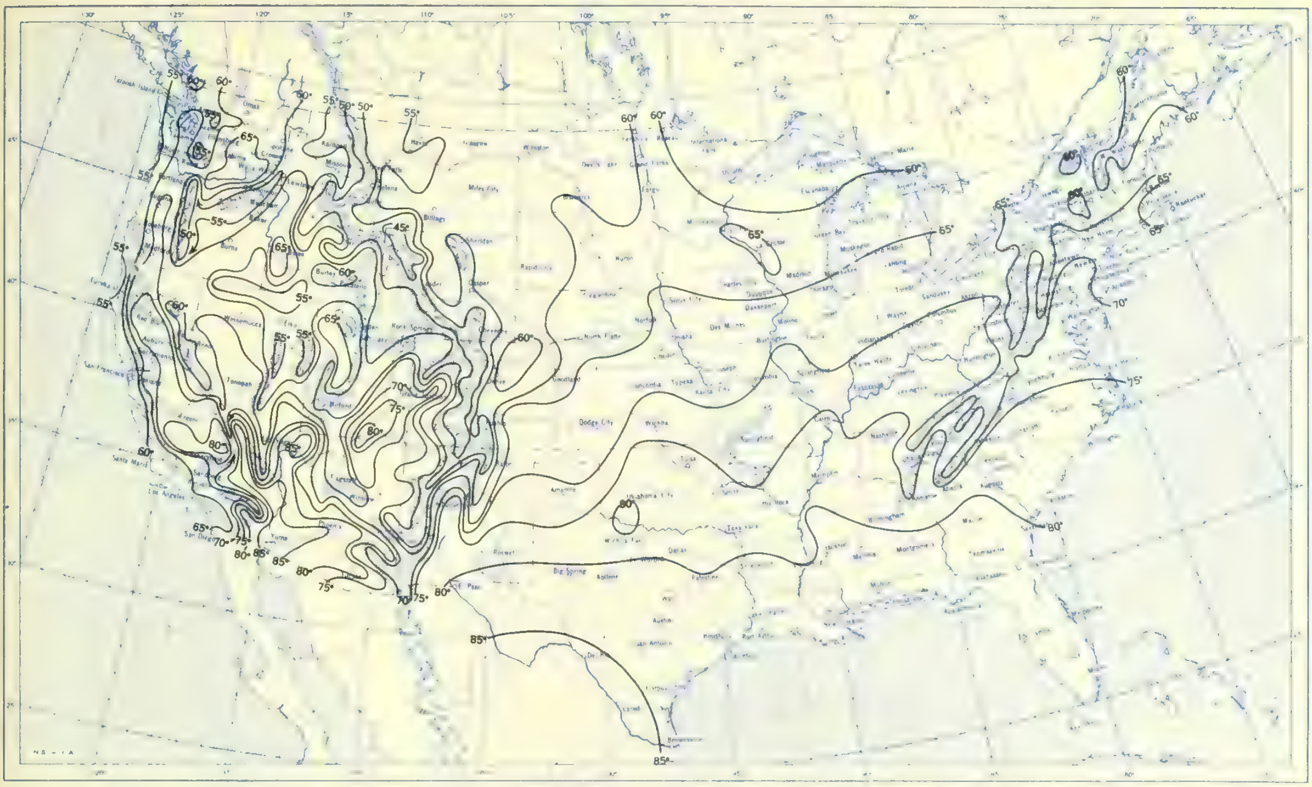
1951	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle, Wash. (U. of W.)	Spokane, Wash.	State College, Pa.	Stillwater, Okla	Swan Island, W.I.	Thule, Greenland	Toronto, Ontario	Upton, N.Y.	Wake Is., Pac. Area	Washington, D.C.	Winnipeg, Manitoba
June 4	633	202	682	136	314	409	695	676		416	656	556	606	400
June 5	253	521	262	360	180	457	411	198		716	251	613	227	693
June 6	738	703	536	309	390	774	349	394		714	708	669	(607)	348
June 7	774	502	627	188	492	758	487	383		711	766	535	618	204
June 8	374	679	196	484	542	288	778	634		680	442	551	(162)	486
June 9	353	585	449	719	745	109	688	617		315	387	698	196	790
June 10	181	403	119	524	645	90	484	697		323	215	706	138	485
Averages	472	514	410	388	473	412	556	507		554	489	603	(365)	487
Departures	-59	---	-124	---	-123	-112	-8	---		+14	-41	---	-150	-24
June 11	(241)	407	704	171	637	588	459	715		553	275	652	644	631
June 12	793	677	690	513	434	312	536	486		638	751	663	456	636
June 13	274	250	151	256	581	55	462	384		70	323	687	(89)	636
June 14	---	82	333	700	779	264	682	663		542	109	---	(711)	351
June 15	622	267	603	755	789	655	660	682		690	562	650	(779)	690
June 16	---	508	692	735	788	720	887	(669)		672	594	714	710	596
June 17	---	536	681	692	778	675	702	654		638	739	685	643	429
Averages	---	390	551	546	684	467	598	(608)		543	479	675	(576)	567
Departures	---	---	+3	---	+83	-1	-1	---		+6	-76	---	+70	+10
June 18	(762)	575	566	722	527	720	551	654		525	742	633	417	537
June 19	736	531	716	745	713	766	678	648		443	723	605	670	601
June 20	(575)	506	615	760	756	555	668	259		200	585	611	490	644
June 21	641	558	504	701	655	761	413	181		599	656	673	586	675
June 22	(382)	386	558	708	662	348	645	235		81	279	709	439	678
June 23	---	276	557	552	506	587	581	503		273	240	564	(567)	515
June 24	---	623	635	570	587	530	605	519		476	723	522	(620)	583
Averages	---	493	593	680	629	610	591	428		371	564	617	(541)	605
Departures	---	---	+54	---	00	+74	-2	---		-133	+30	---	+38	+52
June 25	(639)	645	630	678	754	618	510	689		751	717	564	743	148
June 26	(515)	652	721	655	591	675	685	545		493	776	701	691	746
June 27	367	512	485	739	800	384	699	164		695	302	642	513	460
June 28	365	611	623	731	719	604	566	617		612	380	642	570	304
June 29	149	96	434	733	768	445	336	566		677	176	684	(496)	448
June 30	235	144	321	699	616	336	183	661		235	239	712	(573)	632
July 1	378	367	519	498	353	489	---	(535)		361	465	717	---	---
Averages	(379)	432	533	676	657	507	496	(539)		546	436	666	598	456
Departures	-134	---	+14	---	-26	-20	-51	---		+29	-78	---	+68	-74
Accumulated Departures January 1 to July 1, 1951	-882	---	-315	---	+126	-840	---	---		-1764	-112	---	+1897	+1750

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

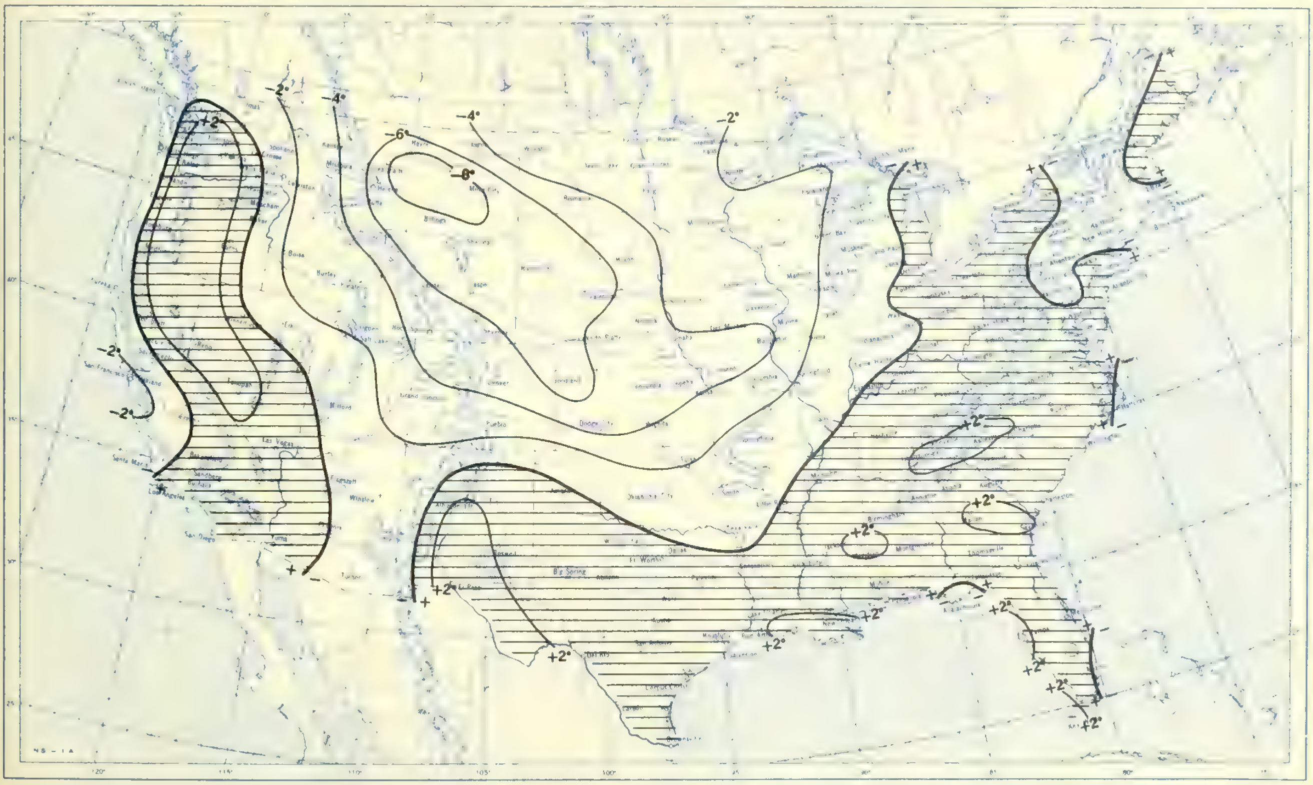
Beginning with this issue, a new station is being added to Table 33 and will appear regularly in this Table in future editions. A brief description of the station follows:

San Antonio, Texas: Latitude 29° 32' N.; longitude 98° 28' W.; elevation 254 meters; Brown integrating potentiometer; excellent exposure; slight smoke from cement factories 3 miles south and 5-1/2 miles east; equipment located at Weather Bureau Office.

Chart I. A. Average Temperature (°F.) at Surface, June 1951.

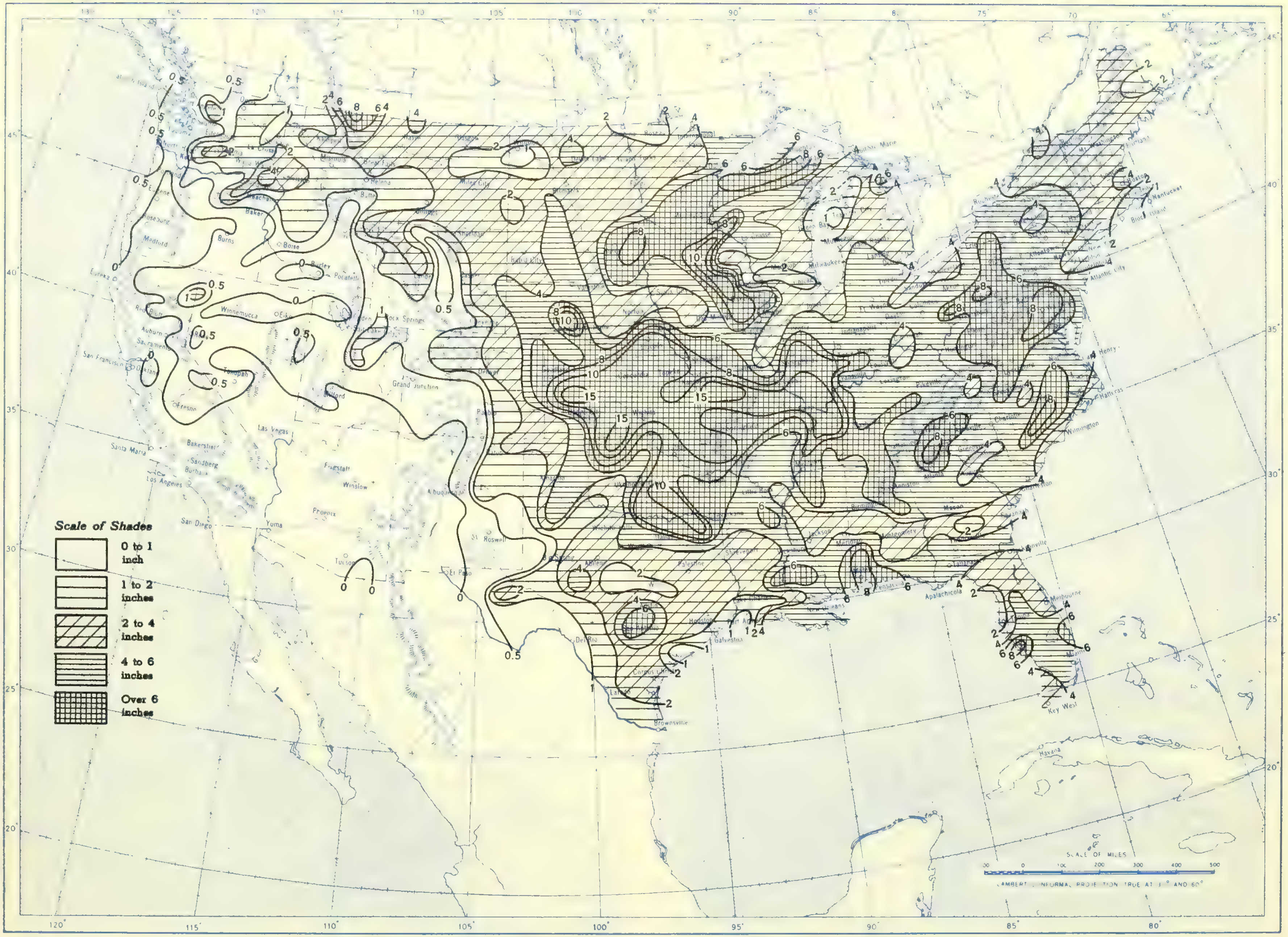


B. Departure of Average Temperature from Normal (°F.), June 1951.



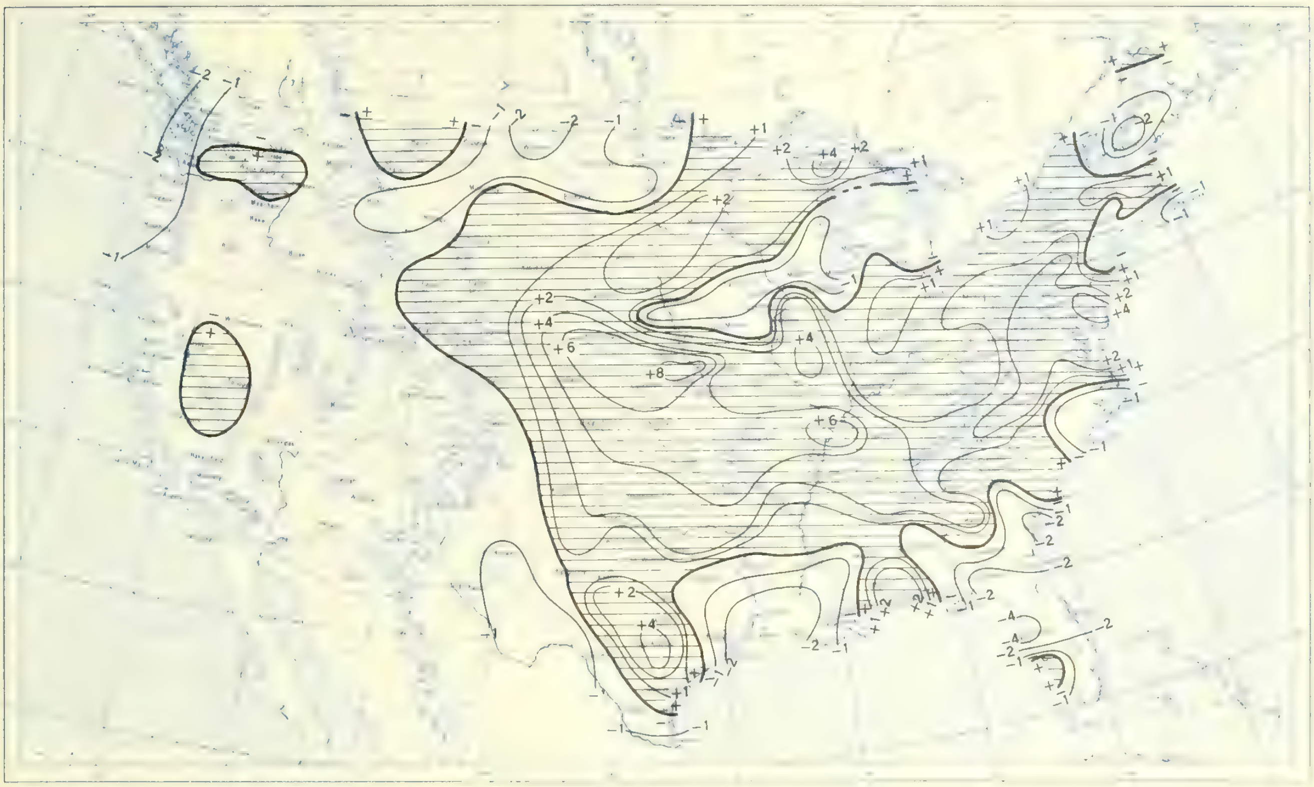
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively. B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), June 1951.

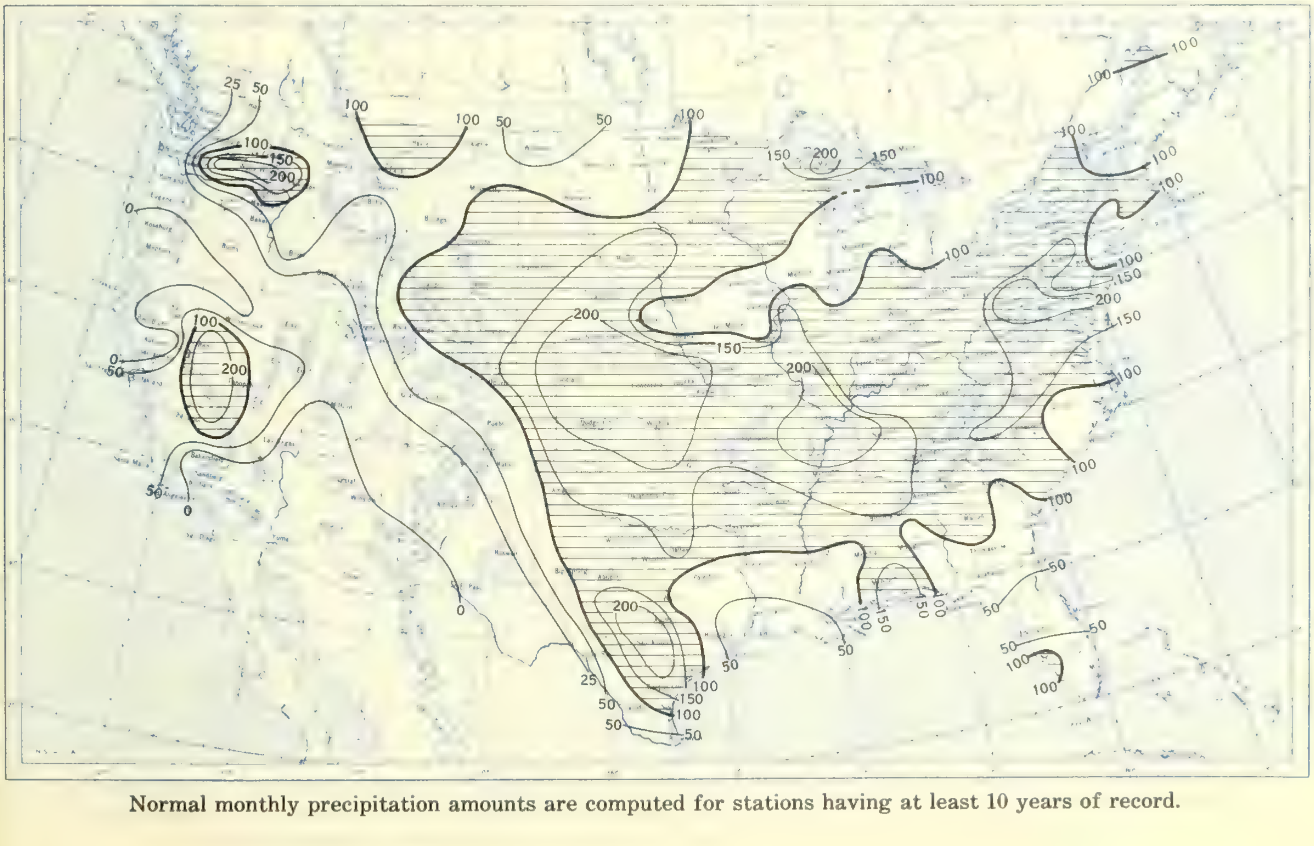


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), June 1951.

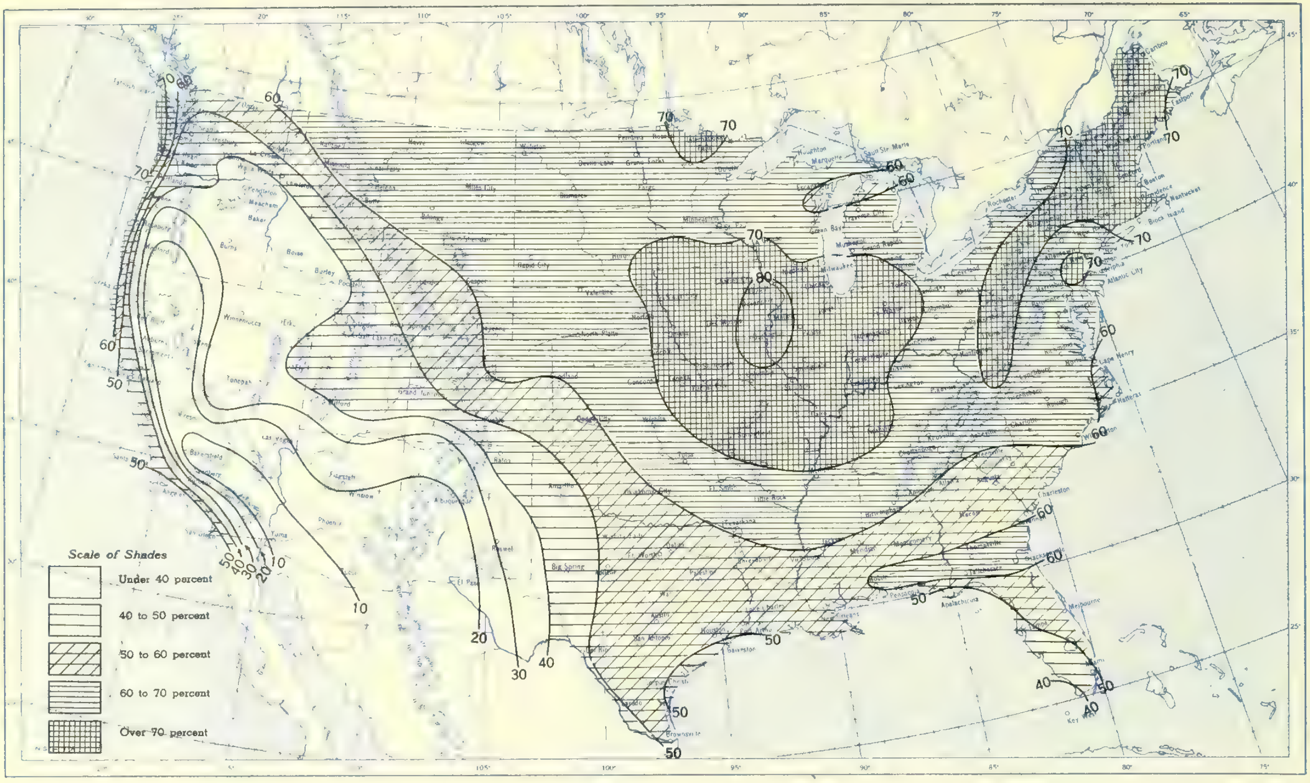


B. Percentage of Normal Precipitation, June 1951.

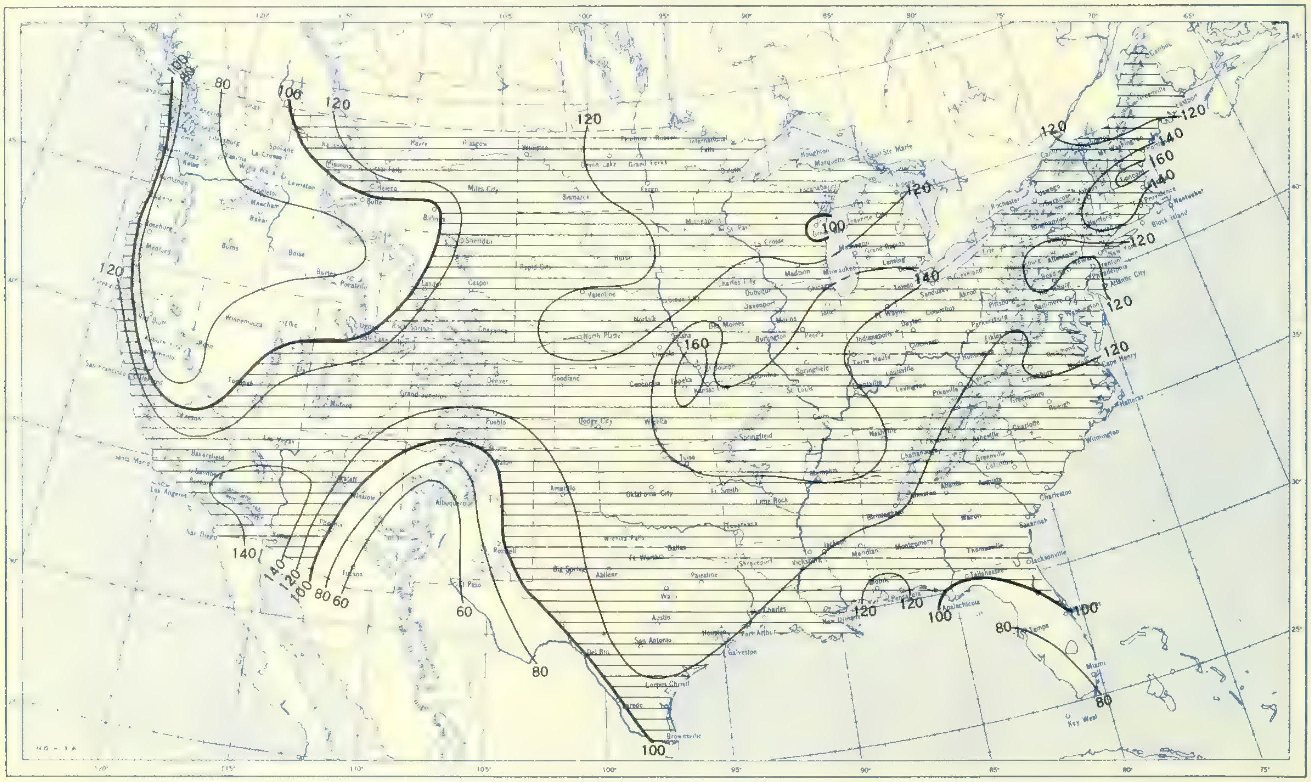


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, June 1951.

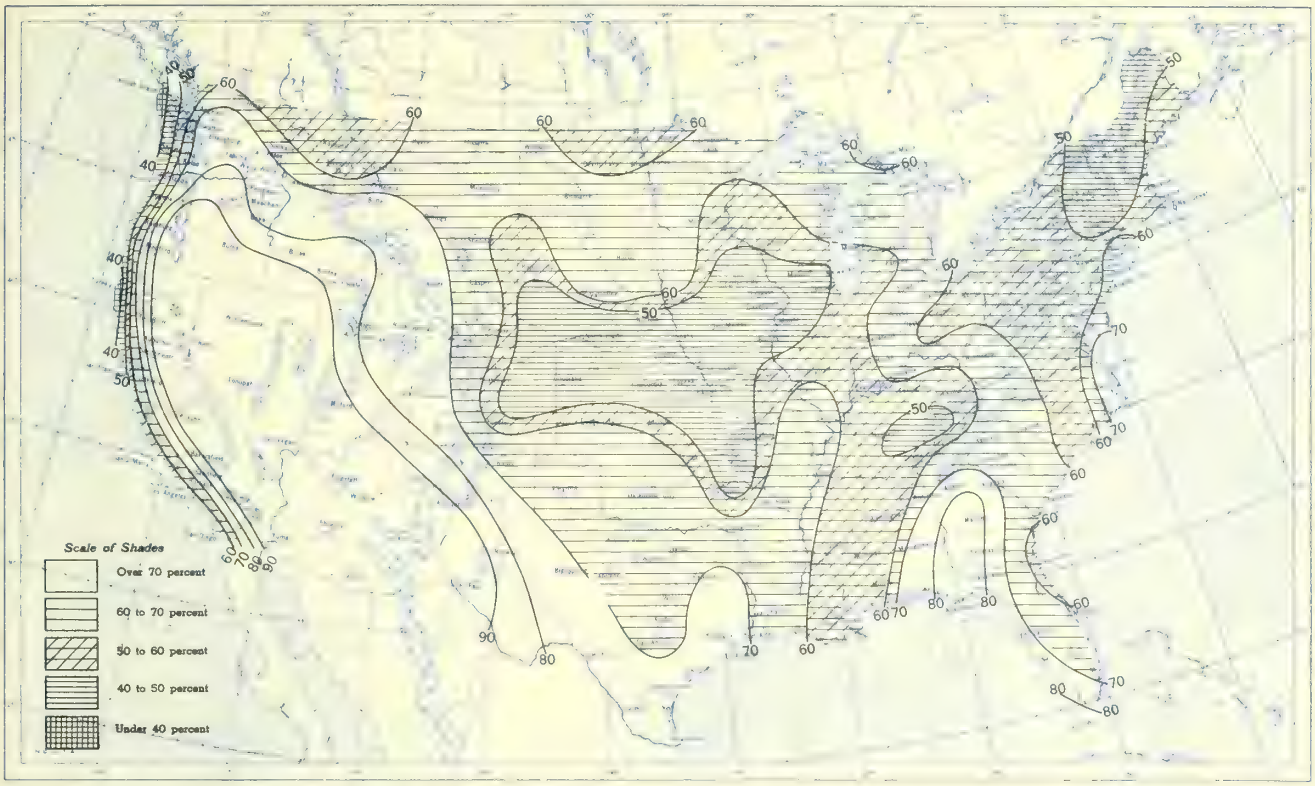


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, June 1951.

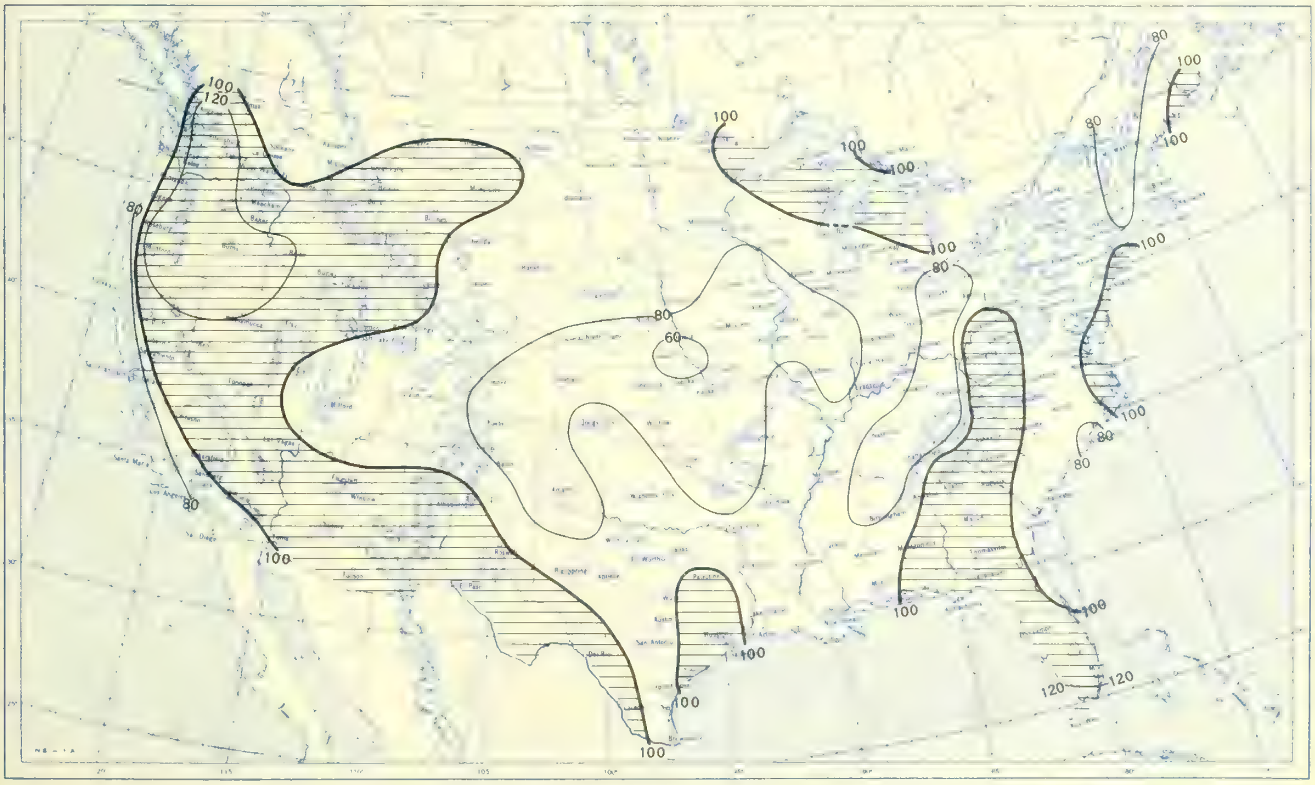


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, June 1951.



B. Percentage of Normal Sunshine, June 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, June 1951. Inset: Percentage of Normal Average Daily Solar Radiation, June 1951.

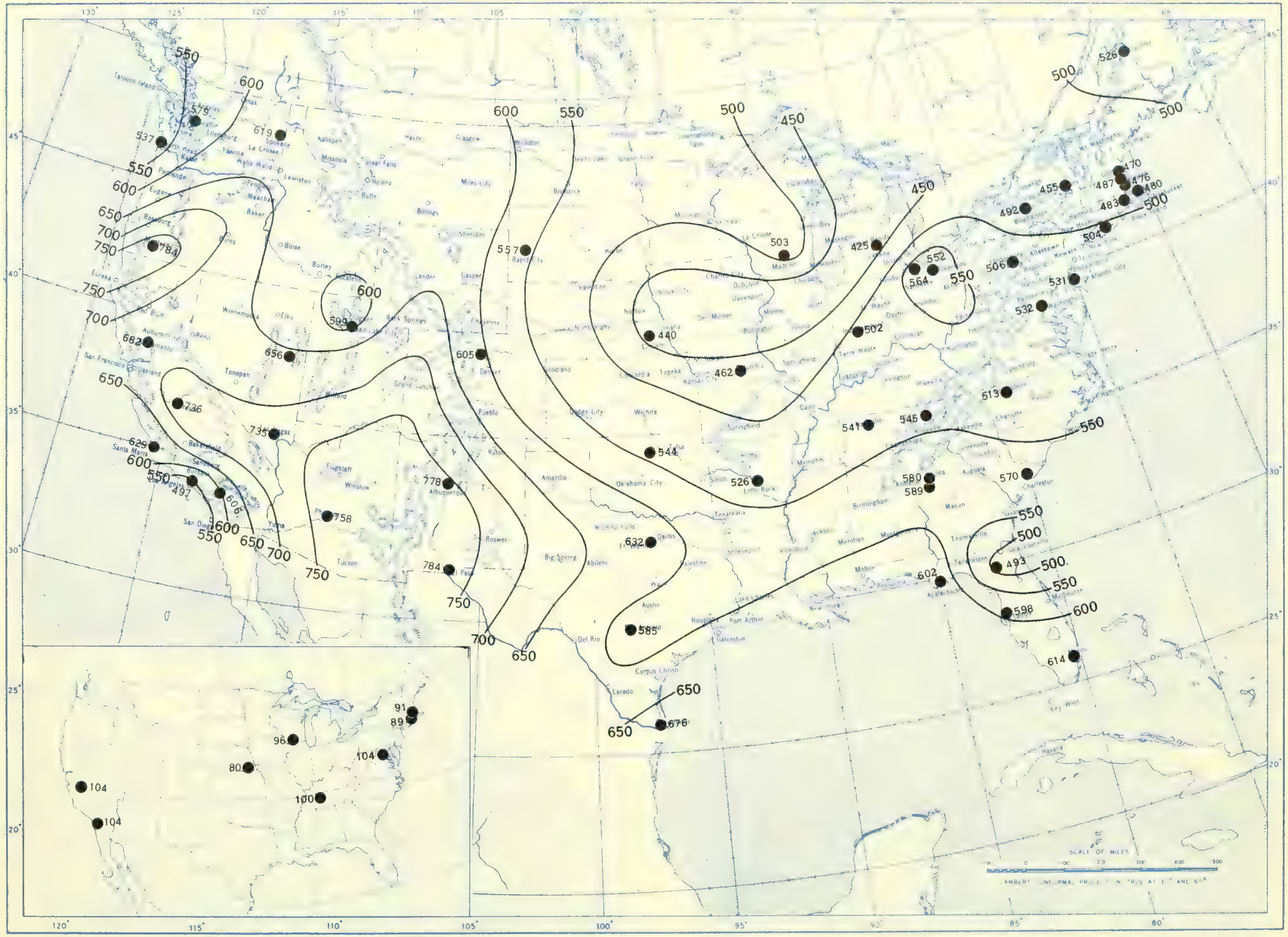
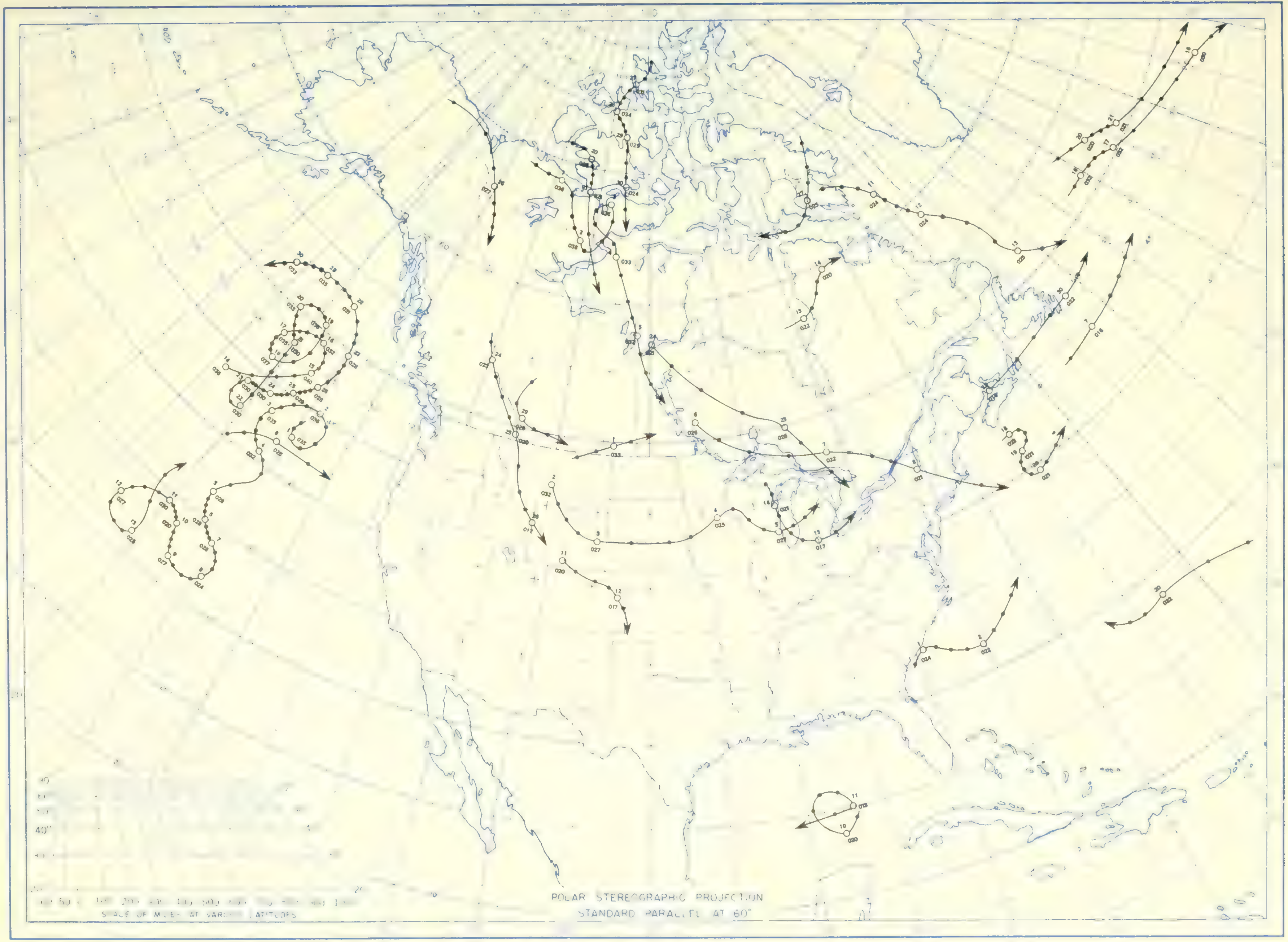


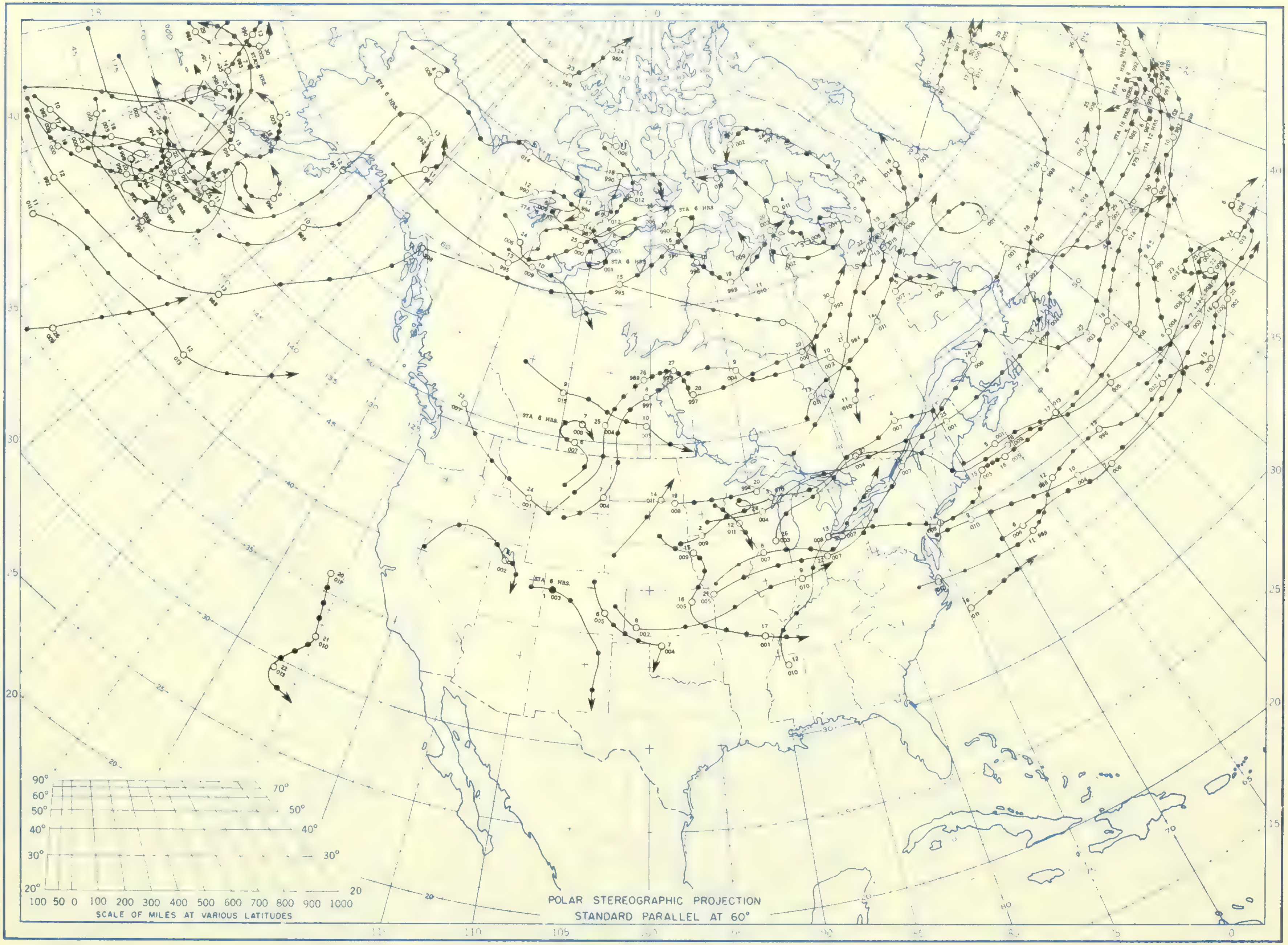
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart IX. Tracks of Centers of Anticyclones at Sea Level, June 1951


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES

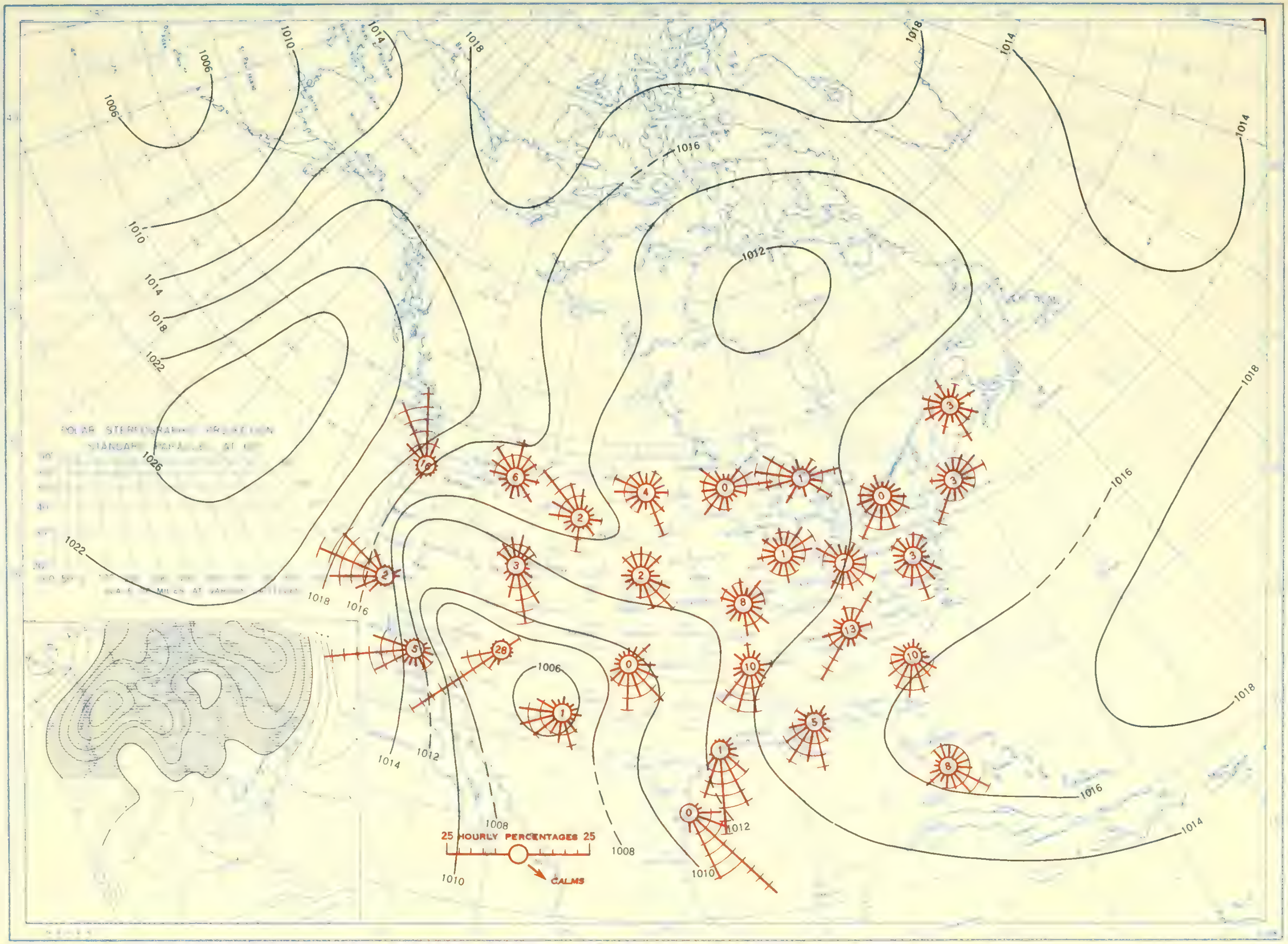
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, June 1951.



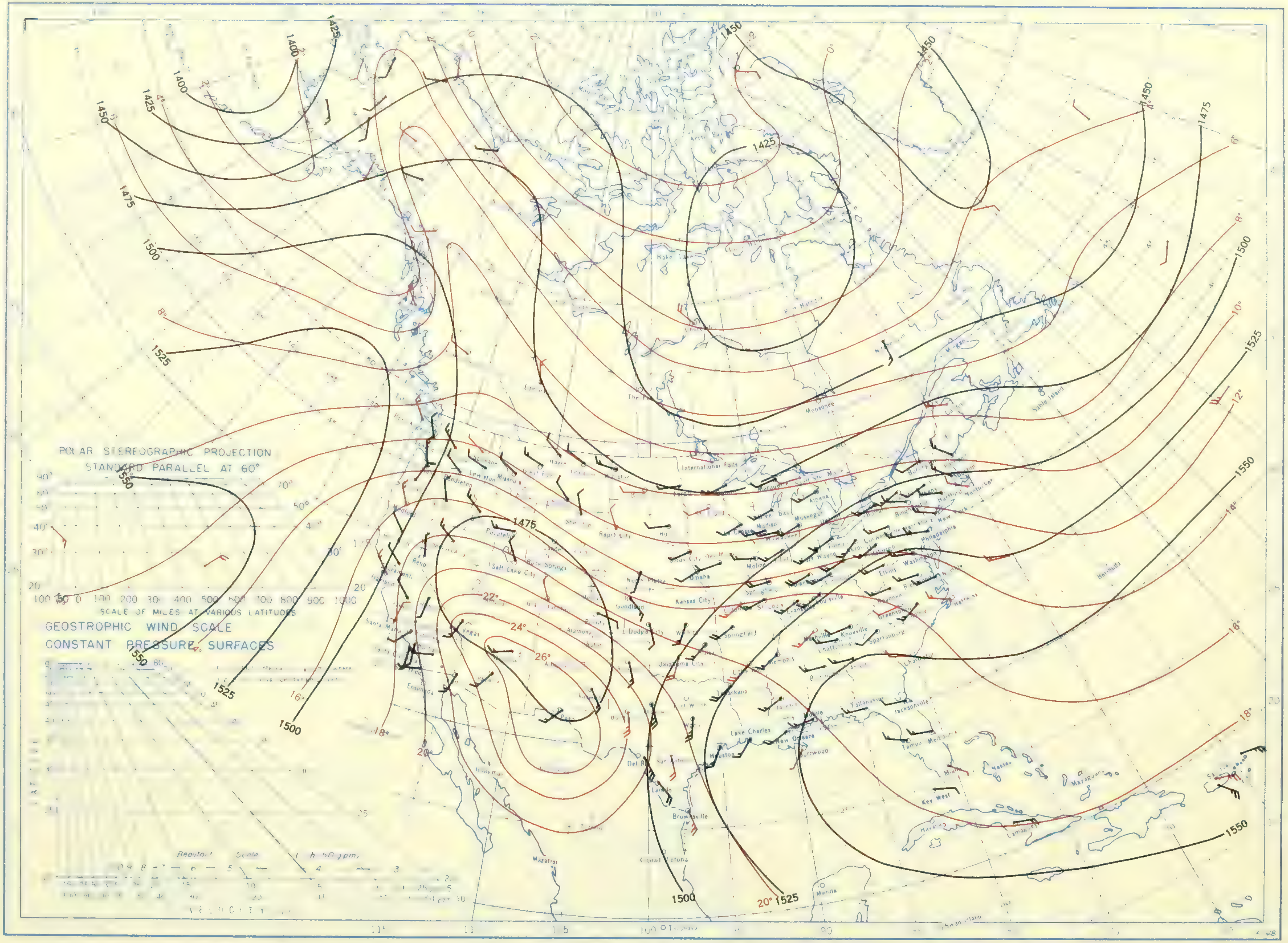
Circle indicates position of center at 7:30 a. m. E. S. T.   See Chart IX for explanation of symbols.

Average Pressure (mb.) from Normal, June 1951.



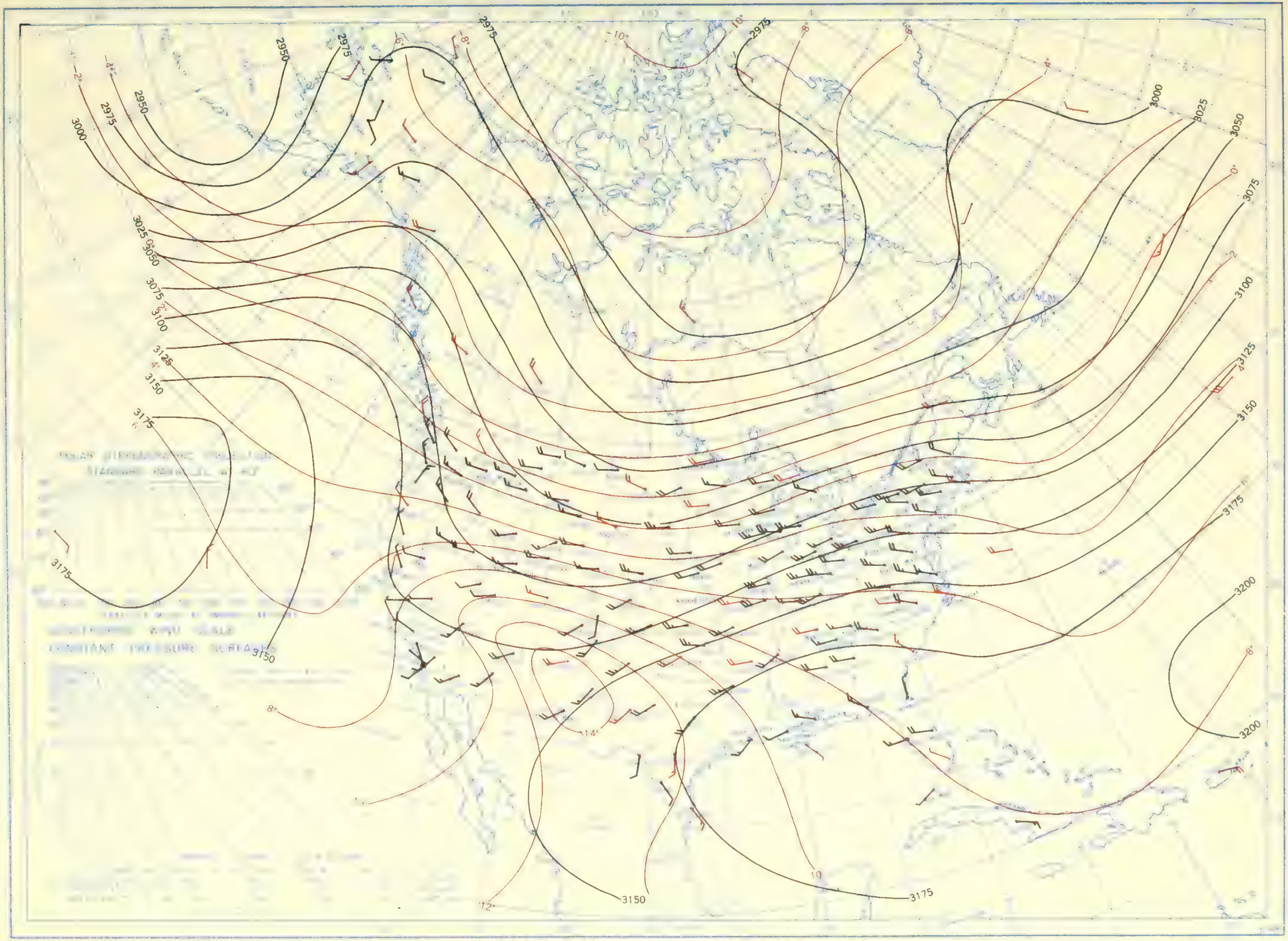
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899-1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), June 1951.



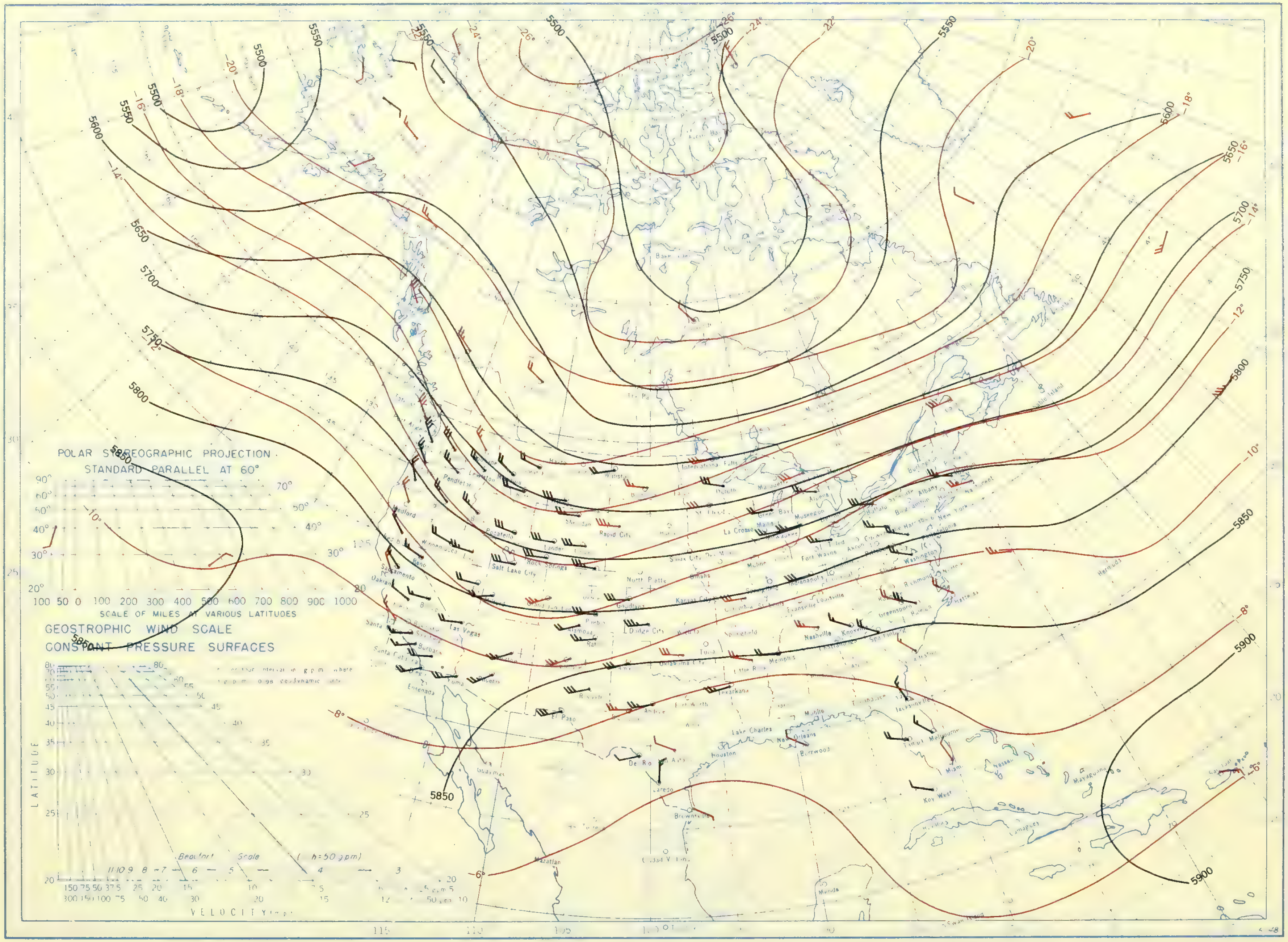
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), June 1951.



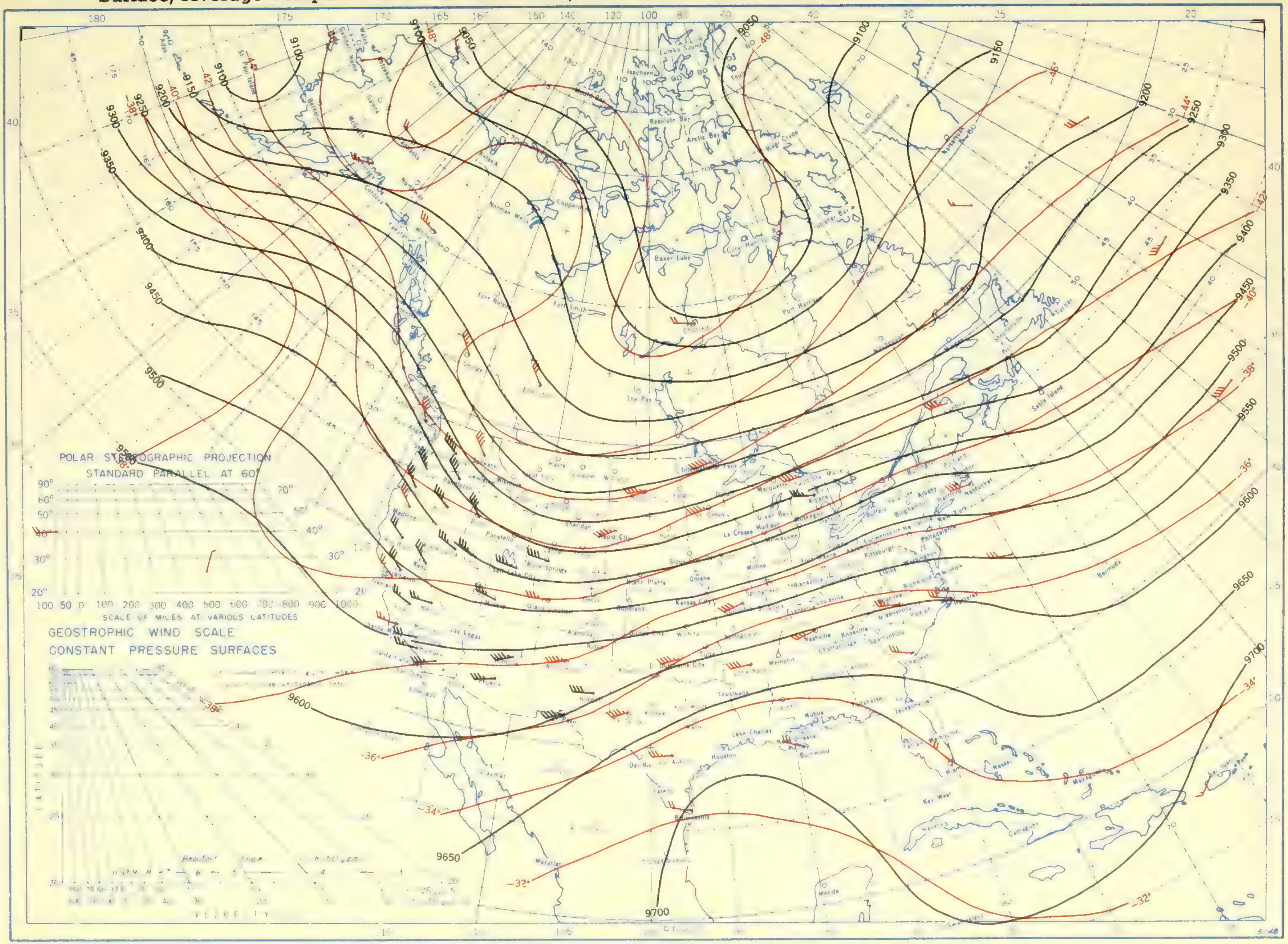
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), June 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), June 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

2.6

U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

JULY 1951
Volume 2 No. 7

NEW ORLEANS: 1951

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions---------- 201

Condensed Climatological Data - States---------- 203

Climatological Data - Stations---------- 204

Heating Degree Days---------- 209

Severe Storms---------- 210

General Summary of River and Flood Conditions---------- 226

Flood Stage Data---------- 233

UPPER AIR DATA

Radiosonde Data---------- 236

Pilot Balloon Data---------- 239

Rawin Data---------- 240

SOLAR RADIATION DATA

Solar Radiation Intensities---------- 241

Blue Hill Data---------- 242

Daily Totals and Average Daily Totals by Weeks---------- 243

CHARTS I-XV

NOTE.—This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 7

JULY 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

The average July temperature for the United States was 74.5° which is 0.3° above the long-term mean. Monthly departures from normal were minus in a large north-central area from Montana and Wyoming to the Great Lakes except along the Canadian Border, with these minus anomalies generally slight but exceeding 2° in northern Kansas, central Nebraska, and southern South Dakota. Slight minus departures also occurred at a few stations in central California, along the east coast of Florida, and in the extreme northern portions of New York and New England. Elsewhere departures were plus and exceeded 2° in the far western interior, the Southwest, along the Northeast Coast, and at a few scattered stations in the Southeast. Plus departures exceeded 5° in much of New Mexico and at a few stations in extreme western Texas.

Based on state-wide average temperatures, the only new July record was established by New Mexico where the high average of 76.4° exceeded the previous record in 1934 by 1.1°. Albuquerque and Roswell, N. Mex., and El Paso, Tex., recorded their highest average July temperatures on record. At El Paso the temperature reached 107° on the 8th for a new all-time record, daily average temperatures were above normal on all except 2 days, and maximum temperatures equaled or exceeded 100° on 14 days which equaled the previous record number of days for July. The 102° recorded at Albuquerque, N. Mex., on the 9th and 30th equaled the all-time high for the station, and the maximum temperature equaled or exceeded 100° on 6 days or as many days as during all the Julys for the past 20 years. At Phoenix, Ariz., a period of 47 consecutive days with maximum temperatures exceeding 100° ended on the 28th.

Temperature extremes for the entire country ranged from 125° at Cow Creek, Calif., on the 18th to 23° at Boca, Calif., on the 4th, Pinedale, Wyo., on the 3d, and Bondurant, Wyo., on the 9th. The highest temperatures of the month exceeded 100° in all the States except those in the Northeast and in a few near the Great Lakes. Highest temperatures generally were recorded in the Southwest on the 7th or 8th, in the Southeast near the middle of the month, at middle latitudes about the 18th to 20th in the western half and after the 22d in the eastern half, and in extreme northern areas generally from the 25th to the 29th. Lowest temperatures generally occurred during the first week except about the 18th to 21st in the New England and Middle Atlantic States. Below freezing temperatures were recorded in South Dakota and at higher elevations in all the Rocky Mountain and Pacific States except Washington. In the East lowest temperatures ranged from the 50's or 60's in the extreme south to the middle 30's in the extreme north.

The average precipitation for the entire country was 2.79 inches, or 0.02 inch above the long-term mean. While the average total amount was near normal, the departure pattern showed great variations between different sections of the country.

Along the East Coast monthly totals were above normal in northern portions of New England and New York, central North Carolina, central Georgia, and in Florida except the extreme northern portion of the Peninsula, with excesses as much as 3 inches or more at a few stations in all these areas. Elsewhere along the Atlantic Coast and in the Ohio Valley and Appalachian Region monthly totals were below normal. Most of the rain throughout the East was of the thunderstorm type generally associated with fronts that crossed the area at intervals during the month. However, in Florida and some adjacent areas of the Southeast air mass thunderstorms were the rule, with only an occasional front penetrating that far south. The greatest monthly amount along the Atlantic Coast was 16.06 inches at Arcadia, Fla.

Monthly totals were also above normal in the upper Mississippi Valley and Lake Region, the central Great Plains, Wyoming, and a belt in the Rocky Mountain Region including western Montana, western Idaho, western Utah, eastern Nevada, and all of Arizona except the extreme east. In Texas, New Mexico, Colorado, and at practically all stations in the Pacific States monthly totals were below normal.

It was extremely dry in the Pacific States. No rain fell at 471 stations in California, 39 in Oregon, and 6 in Washington. The greatest monthly total for any station in California was only 3.39 inches and a little over an inch in Washington and Oregon. Measurable rain fell on an average of only 3 days in Washington and 2 days in Oregon. The forest fire hazzard was high all month in some areas, especially in parts of Oregon where 250 fires burned nearly 4,500 acres.

In Texas thunderstorms during the first few days caused above-normal amounts in parts of the Panhandle, the Red River Valley, and along the Upper Coast, but the remainder of the month was dry and monthly totals were below normal. Del Rio received only a trace for the entire month, and many stations in the central and extreme southern portions received only a few hundredths.

The heaviest rainfall of the month and that which produced the most far-reaching results occurred in eastern and central Kansas, southeastern Nebraska and western Missouri, with monthly totals ranging up to 20.40 inches in Kansas, 13.82 in Nebraska, 17.29 in Missouri, and 14.41 in Oklahoma. The greatest part of these totals were accumulated during the first half of the month during showers of great intensity. At Henrietta, Mo., 9 inches of rain were recorded in a 7-hour period during the early morning of the 6th, and of this amount nearly 5 inches fell in 2 hours. Heavy rainfall fell throughout northwestern Missouri on the 5th, 6th, and 7th, and beginning on the 9th another period of heavy rainfall lasted 3 or 4 days. Heavy rains also fell in eastern Nebraska on the 5th and 6th, Auburn measuring 6.44 inches during the night. At

Broken Bow, Okla., 11.64 inches fell in a 44-hour period ending at 12:45 p.m., July 2. Of this total 8.60 inches were measured for a 24-hour period ending 7:00 a.m., July 1. In northern and eastern Kansas from the night of the 9th and 10th through the early hours of the 12th, 5 to 15 inches fell. All these heavy rains fell in an area where rivers were already overflowing and soils saturated from unusually heavy rainfall through May and June. The result was one of the most damaging floods in the history of the country, the greatest damage occurring along the Kansas and Missouri Rivers. As yet no official estimate of total damage is available, but unofficial accounts have mentioned amounts ranging from one to two and one-half billion dollars.

On the 10th and 11th snow fell in the northern Rocky Mountains and Black Hills. Mystic Lake, Mont., received 2 inches of snow on the 10th; Lakeview, Mont., 2 inches on the 11th; Bixby Dam, S. Dak., 0.4 inch on the 11th; and the east entrance to Yellowstone Park, Wyo., 6.5 inches on the 10th.

Thunderstorm distribution was about normal for July. But the frequency was higher than usual in the areas of heavy rainfall of the Northeast, Southeast, and central portions of the country. Days with measurable rain exceeded 20 at some stations in Florida and along the central Gulf Coast, less than 10 in the southern Lake Region and in much of the Ohio Valley, and about 10 in most other areas east of the Mississippi River. They ranged from 10 to 13 days in Missouri, Iowa, eastern portions of Kansas and Nebraska, and most of Wisconsin, Minnesota, and extreme eastern portions of the Dakotas.

Sunshine was above normal where rainfall was below normal, and below normal where rainfall was above normal; the only exception being along the West Coast where both sunshine and precipitation were below normal.

Pressure was generally above normal in the northeastern half of the country and below in the southwestern half, although anomalies were slightly below at stations in the northern Lake Region, the extreme Northeast, along the Gulf Coast, and in Florida.

Severe storms were numerous in the central and northeastern sections of the country and were usually associated with thunderstorm activity. Over 50 deaths, several hundred injuries, and damage totaling between $25,000,000 and $30,000,000 resulted from these storms. Lightning was the greatest killer, accounting for at least 30 deaths. One outstanding tornado, the most damaging on record in Minnesota, swept through Hennepin County on the 20th causing 5 deaths and $6,000,000 damage. Hail damage was greatest in Montana, amounting to about $3,000,000. A flash flood caused $8,000,000 damage in Wisconsin on the 21st. Ball lightning, a rare phenomenon not well understood, was reported to have occurred at Allentown, Pa., during the night of the 27th and 28th.

Weather conditions generally favored crops, although nonirrigated crops suffered from lack of moisture in many sections of the far West and too much rain was detrimental in parts of the Midwest and central Great Plains. During the first 10 days mostly fair, sunny weather over the Main Cotton Belt favored development, cultivation, and insect control, and cotton improved. However, moderate to heavy showers in portions of Arkansas, Tennessee, and Georgia temporarily slowed cultivation, and favored weevil activity, and lack of rain in the southern two-thirds of Texas caused slight deterioration. By the end of the third week many Gulf and southeastern sections urgently needed rain, but this situation was relieved during the fourth week by good rains in most areas. The drought in central and southern Texas, however, continued throughout the month and prospects steadily declined.

During the first half of the month cool, wet weather delayed development and cultivation of corn in much of the Main Belt. About the middle of the month the weather became more favorable—warm and sunny. Much of the crop was weedy in the middle and western portions of the Main Corn Belt, and a considerable acreage was destroyed by floods in Kansas and Missouri. In Iowa the crop was about 2 weeks late, with only one-half the acreage laid by at the middle of the month, while normally all would have been laid at that time. The crop was in good condition generally in the South and East. The need for rain was urgent in parts of the South and along the central Atlantic Coast by the end of the third week, but this situation was relieved in most of the dry areas by timely rains during the last week. Warm, sunny weather in the Main Belt the last half of the month improved the crop. In northwestern Texas and much of Oklahoma, however, rain was needed at the end of the month.

The heavy and frequent rains in the central Great Plains hampered the small grain harvest, especially during the first half of the month. Soft ground kept machinery, such as heavy combines, out of the fields and even when the ground dried rank weed growth made operation of combines difficult. The long delay in harvesting during the first half of the month allowed nearly all of the crop to become ready for harvest at the same time and considerable shattering occurred before it could be harvested. Numerous wind and hailstorms caused additional losses, and a large acreage in the flooded areas of Kansas and Missouri were a complete loss. A measure of the delay in harvesting was furnished by the report from Missouri, which estimated that only 24 percent of the crop in that State was harvested by the middle of the month when normally 80 percent of the total crop is harvested by that time. With more favorable weather during the latter half of the month fair to good progress was made and by the end of the month harvesting was virtually finished as far north as Kansas and Missouri and was progressing rapidly in more northern areas. Dry, sunny weather in the far West was excellent for harvesting operations, but decreased the prospects for spring wheat. Progress and condition of spring grains in north-central areas were good. In the East weather conditions were generally favorable for both the development and harvest of all small grains.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 JULY 1951

Section	Temperature								Precipitation					
			Monthly extremes								Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		in.
Alabama	81.3	+1.0	Eufaula	103	16	Alexander City 6NE	56	8	4.34	-1.25	Mobile WB AP	11.65	Marion Junction 2NE	0.37
Arizona	81.7	+1.5	2 Stations	116	*7	Maverick	30	5	1.40	-.27	Mt. Lemmon	5.38	2 Stations	.00
Arkansas	80.5	.0	Monticello	104	10	2 Stations	51	*1	5.83	+2.09	Newhope	11.76	Berryville	.74
California	75.6	-.3	Cow Creek	125	18	Boca	23	4	.08	-.03	Mill Creek Intake	3.39	433 Stations	.00
Colorado	68.9	+1.5	La Junta CAA AP	107	20	Grand Lake 1N	25	1	1.41	-.61	Burlington 12NNE	7.39	Manassa	.00
Connecticut	71.7	+1.7	Waterbury	94	*26	Kent	41	21	3.38	-.56	Putnam	6.19	Bloomfield	.56
Delaware	76.1	0.0	Georgetown	96	23	Georgetown	52	7	4.94	+.24	Milford	8.33	Wilmington City Hall	2.51
Florida	81.7	+.4	2 Stations	102	14	Jasper 10E	58	9	7.33	-.16	Arcadia	16.06	Merritt Island	2.66
Georgia	80.6	+.3	Bainbridge	107	3	Blairsville Exp. Sta.	49	8	5.19	-.69	Camp Stewart	13.46	Maysville	1.03
Idaho	69.0	+.6	Grand View	110	17	Elk City	26	21	.62	+.01	Tetonia Exp. Sta.	2.35	2 Stations	.00
Illinois	74.8	-1.6	2 Stations	98	*16	Chicago Heights	44	8	4.63	+1.40	Toulon	13.81	Salem	1.30
Indiana	74.1	-1.5	Markland Dam	103	26	Plymouth Power	41	6	3.89	.56	Greencastle	9.04	Butlerville	.59
Iowa	72.1	-2.8	2 Stations	98	*16	2 Stations	42	5	4.45	+.85	Delaware	9.05	Tingley	1.55
Kansas	76.8	-2.8	3 Stations	107	20	14 Stations	51	*1	6.60	+3.65	Alta Vista	20.40	2 Stations	.47
Kentucky	76.9	-.1	Farmers	100	23	Mammoth Cave Pk	45	6	2.85	-1.32	Monticello	6.79	Fords Ferry Dam 50	.74
Louisiana	82.6	+.5	Lake Providence	104	*20	Camp Polk	59	1	5.53	-.35	Jeanerette Exp. Sta.	13.95	Oak Ridge	1.03
Maine	67.0	-.1	3 Stations	91	*8	Lac Frontiere	35	18	6.33	+2.93	Rockland	10.52	North Andover	3.98
Maryland	76.0	+.8	Owings Ferry MD Lding	99	23	2 Stations MD	40	6	3.33	-.97	Conowingo Dam	7.50	Lawrel 3W MD	.84
Massachusetts	71.1	+.6	2 Stations	94	24	West Cummington	39	21	3.69	+.16	2 Stations	8.13	Hatchville	1.43
Michigan	67.7	-1.3	Huron Mt.	96	*25	Kenton U.S. Forest	33	*5	3.95	+1.21	Escanaba WB City	9.93	Grand Lodge	.23
Minnesota	68.2	-1.6	3 Stations	98	*25	3 Stations	36	*1	3.27	-.05	Maple Plain	12.12	Crookston	.65
Mississippi	81.9	+.8	6 Stations	101	*20	4 Stations	62	*2	4.69	-.37	White Sand	9.63	Macon 2NE	.99
Missouri	76.7	-1.0	Malden CAA AP	99	22	3 Stations	48	*1	5.59	+2.06	Lexington	17.29	Monroe City	1.70
Montana	67.1	-.6	Wolf Point 4ESE	109	28	West Yellowstone	26	12	1.39	-.07	Babb 6NE	4.14	Grant	.06
Nebraska	72.3	-3.2	3 Stations	103	20	Arthur	39	3	4.07	+.98	Auburn	13.82	Chambers	1.66
Nevada	73.7	+.2	2 Stations	115	*18	Wilkins	26	5	.51	+.12	Searchlight	2.23	17 Stations	.00
New Hampshire	68.0	0.0	Do	92	*12	First Conn. Lake	37	18	5.57	+1.84	Mt. Washington	10.22	New Castle	2.83
New Jersey	74.3	+.4	Do	98	*9	Sussex	41	21	4.26	-.49	Belvidere	10.59	Fortescue	.84
New Mexico	76.4	+3.1	Jal	111	8	Gavilan	30	3	1.66	-.61	Pennington	7.79	White Sand NM	.00
New York	69.1	-.7	2 Stations	96	27	2 Stations	39	*3	4.71	+.75	Cleveland	11.15	Bridgehampton	.97
North Carolina	77.5	+.6	Lawrinburg	103	13	Do	39	*6	5.24	-.78	New Bern	13.74	Swannanoa	1.24
North Dakota	68.2	-1.4	2 Stations	105	*25	Parshall	33	10	1.94	-.53	Ashley	5.18	Powers Lake 1N	.10
Ohio	73.2	-.4	Ironton	100	23	Mosquito Creek Dam	42	6	2.60	-1.18	Alliance Sewage Plt.	7.43	Child Dam 34	.35
Oklahoma	82.3	.0	2 Stations	110	*18	Canton Dam	53	1	2.99	+.20	Broken Bow	14.41	Shattuck	.10
Oregon	67.4	+.5	Huntington	109	18	Fremont	27	8	.21	-.23	Summit	1.37	39 Stations	.00
Pennsylvania	71.7	-.4	Middletown Olmstead	98	27	Philipsburg CAA AP	35	21	3.94	-.39	Portland	12.52	2 Stations	1.16
Rhode Island	72.0	+1.6	Providence WB City	92	16	Kingston	46	21	1.31	-1.63	Providence WB City	2.38	Block Island WB City	.79
South Carolina	80.2	+.3	2 Stations	103	*13	Union 7SW	50	7	5.70	-.26	Florence	11.11	Crescent	.27
South Dakota	70.4	-2.7	Faith	111	29	Deerfield Dam	29	1	2.34	-.08	Wilmot	6.23	White Horse	.55
Tennessee	78.2	+.4	Savannah	103	22	Gatlinburg 2SW	48	7	4.01	-.51	Hebbetsburg	10.49	Summitville	.24
Texas	84.6	+2.4	Pecos	112	6	Levelland	48	2	1.53	-.93	Port Arthur WB City	7.65	Numerous	.00
Utah	73.0	+1.1	St. George CAA	110	18	Clear Creek	28	12	.98	+.02	High Line City Creek	4.24	Escalante River Mouth	T
Vermont	67.6	-.2	Bellows Falls	94	17	Somerset	40	*7	5.23	+1.37	Waterbury	6.93	Grafton	3.59
Virginia	75.8	+.5	3 Stations	100	*23	Burkes Garden	38	6	3.87	-.83	Surry 3S	11.66	Lincoln	1.17
Washington	67.1	+.4	Nespelem 2S	107	28	3 Stations	33	*4	.34	-.31	Laurier	1.03	6 Stations	.00
West Virginia	73.1	0.0	Logan	103	24	Cranberry Glades	34	6	2.97	-1.66	Jane Lew	9.23	Logan	.63
Wisconsin	68.5	-1.6	Sheboygan	95	27	Prentice 6W	36	4	5.12	+1.70	Viroqua	10.70	Racine	2.47
Wyoming	65.8	-.5	Hampshire 3SW	106	19	2 Stations	23	*3	1.78	+.46	Weston 3N	5.81	Green River	.11
Alaska (May)	40.9	+2.7	Nenana CAA	78	31	Barter Island	-3	*14	.83	-.48	Whittier	11.76	2 Stations	.00
Hawaii (June)	73.5	-.1	Puunene AP	94	*9	Haleakala RS	37	4	2.94	-1.76	Kukui	26.00	4 Stations	.00
Puerto Rico (May)	77.8	+1.0	Guayama (2)	95	*4	Guineo Reservoir	57	*9	8.60	+.90	Guineo Reservoir	24.59	Comerio Falls	2.67
Puerto Rico (July)	78.8	+.4	Guayama	99	16	Guineo Reservoir	57	25	7.20	+1.03	Rio Blanco (1800 Ft.)	17.12	Villalba (Toro Negro#1)	2.66

* Other dates also.

CLIMATOLOGICAL DATA

Table 2

JULY 1951

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Date	Temperature: Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
ALABAMA																																	
Birmingham	610	992.6	1017.0	91	71	81.0	+1.3	97	18	65	9	19	0	69	71	4.10	-1.07	1.73	8	9	0.0	0	5.9	SE	35	NW	5	6	20	5	5.5	73	0
Mobile CO	10	------	------	91	75	83.4	+2.0	98	18	70	14	20	0	--	--	7.76	+.87	2.44	13	14	.0	0	9.0	---	42	SE	8	6	16	9	5.8	57	0
Mobile	211	1008.8	1016.5	92	72	82.0	----	99	18	67	14	23	0	73	78	11.65	-----	3.92	15	16	.0	0	7.1	SW	--	--	--	8	15	8	5.4	--	0
Montgomery CO	201	------	------	---	--	----	----	---	--	--	--	--	-	--	--	---	-----	----	--	--	---	-	----	---	--	--	--	-	--	-	---	--	0
Montgomery	198	1009.1	1016.5	95	72	83.4	+1.5	100	16	65	9	29	0	70	69	2.46	-2.40	1.59	8	10	.0	0	5.5	S	30	SW	2	10	14	7	4.9	78	0
ARIZONA																																	
Flagstaff	6993	791.1	1016.0	84	52	67.8	----	90	7	43	2	1	0	45	51	4.47	-----	2.10	10	17	T	0	6.5	SW	--	---	--	13	13	5	4.2	--	4
Payson CO	5000	849.3	1012.9	95	61	78.3	----	102	30	56	2	29	0	52	47	1.47	-----	.37	13	17	.0	0	4.2	SSW	--	---	--	11	14	6	4.5	--	0
Phoenix CO	1083	------	------	106	79	92.7	+2.9	111	6	73	28	31	0	--	--	1.30	+.23	.86	4	5	.0	0	6.7	---	30	NE	27	--	--	-	---	93	0
Phoenix	1108	969.9	1007.4	107	78	92.5	----	112	6	72	2	31	0	60	38	1.06	-.01	.70	5	5	.0	0	5.3	W	--	---	--	16	13	2	3.6	--	0
Prescott	5014	848.3	1011.3	92	62	77.3	----	98	6	57	11	26	0	47	40	1.46	-----	.65	8	16	.0	0	8.7	SW	33	SW	10	15	10	6	3.8	77	0
Tucson	2558	923.5	1008.8	102	76	88.8	+2.4	108	30	70	27	31	0	58	42	1.49	-.75	.40	13	13	.0	0	6.4	SE	39	N	15	8	13	10	5.6	76	0
Winslow	4880	852.4	1009.3	95	65	80.1	+3.4	102	8	57	4	30	0	44	34	.86	-.75	.73	4	11	.0	0	8.9	SW	*57	ESE	18	14	13	4	3.6	--	0
Yuma	203	1002.4	1007.2	109	81	94.9	----	115	21	72	1	31	0	61	37	.55	-----	.52	2	4	.0	0	9.5	SSE	50	SE	28	24	5	2	2.2	95	0
ARKANSAS																																	
Fort Smith	458	998.6	1014.8	92	72	82.2	+.7	100	21	61	1	27	0	72	77	3.54	+.17	1.67	7	10	.0	0	6.3	NE	26	NE	28	11	15	5	4.6	68	0
Little Rock	257	1002.7	1015.6	91	73	82.1	+1.2	98	21	66	1	25	0	73	81	7.60	+4.10	2.60	9	11	.0	0	5.8	S	31	NE	4	5	15	11	6.1	73	0
Texarkana	361	1002.0	1015.2	93	74	83.3	+.4	99	21	67	1	28	0	72	76	3.65	-.14	2.61	6	6	.0	0	6.6	NE	--	---	--	9	14	8	5.4	--	0
CALIFORNIA																																	
Bakersfield	489	992.9	1010.2	98	67	82.6	-1.5	107	18	58	4	30	0	50	34	T	-.01	T	0	0	.0	0	5.6	WNW	--	---	--	28	1	2	1.0	--	0
Beaumont CO	2589	923.5	1011.8	95	58	76.4	----	103	31	49	4	25	0	50	46	.29	-----	.29	1	5	.0	0	7.7	W	*20	E	°16	20	9	2	2.4	--	0
Bishop	4108	872.3	1009.5	100	58	78.6	----	105	9	45	4	31	0	--	--	.07	-----	.05	2	0	.0	0	----	---	--	---	--	21	8	2	2.6	--	0
Blue Canyon	5280	840.5	1011.3	79	59	68.6	----	86	18	46	3	0	0	37	32	.00	-----	.00	0	0	.0	0	8.7	SSW	--	---	--	28	2	1	.9	--	33
Burbank	699	986.1	1012.1	88	62	74.7	----	97	6	52	5	14	0	57	61	.01	-----	.01	1	0	.0	0	6.2	S	*18	SE	17	18	13	0	2.7	--	0
Eureka CO	43	1014.9	1017.3	59	52	55.8	+.3	65	15	48	6	0	0	--	--	.05	-.06	.02	4	0	.0	0	6.8	---	18	SW	°11	1	10	20	8.2	28	279
Fresno	331	999.0	1010.5	97	61	79.2	-2.1	107	18	51	4	28	0	53	49	.00	-.01	.00	0	0	.0	0	7.5	WNW	20	NW	15	29	1	1	.7	99	0
Los Angeles CO	312	------	------	83	63	72.8	+2.6	92	18	56	5	5	0	--	--	T	-.01	T	0	1	.0	0	5.0	---	17	W	°4	17	13	1	3.1	81	0
Los Angeles	99	1008.8	1012.4	75	62	68.6	----	84	19	56	5	0	0	58	73	.00	-----	.00	0	0	.0	0	5.2	WSW	--	---	--	14	16	1	3.5	--	3
Mt. Shasta CO	3543	892.0	1013.6	87	49	68.2	+.3	97	22	38	6	10	0	42	42	T	-.14	T	0	0	.0	0	6.8	SSE	--	---	--	28	3	0	.6	--	24
Oakland	3	1014.2	1014.5	69	54	61.6	-.3	89	18	49	6	0	0	52	75	T	-.01	T	0	0	.0	0	8.0	W	--	---	--	9	15	7	5.1	--	113
Red Bluff	341	998.3	1011.1	98	65	81.3	+.5	108	30	56	3	27	0	46	32	.00	-.03	.00	0	0	.0	0	6.5	SSE	20	SE	3	30	1	0	.3	100	0
Sacramento CO	25	------	------	---	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	2
Sacramento	17	1010.2	1011.2	90	55	72.9	-.3	105	18	49	4	18	0	53	56	.00	.00	.00	0	0	.0	0	11.8	SW	30	SW	3	29	2	0	.7	98	1
Sandberg CO	4517	862.9	1011.4	87	63	75.3	----	95	31	49	4	13	0	37	28	T	-----	T	0	0	.0	0	13.5	NW	--	---	--	27	2	2	1.5	--	1
San Diego	19	1009.1	1012.4	75	63	69.3	+.8	87	19	59	6	0	0	59	74	.00	-.03	.00	0	0	.0	0	6.4	W	17	W	6	14	11	6	4.4	65	0
San Francisco CO	52	------	------	61	51	56.3	-2.2	75	18	49	14	0	0	--	--	.01	-.01	.01	1	0	.0	0	11.5	---	30	W	30	8	9	14	6.4	56	266
San Francisco	1	1013.9	1014.5	67	51	58.8	-.5	81	18	44	29	0	0	51	80	T	.00	T	0	0	.0	0	14.0	WNW	31	W	5	14	11	6	4.5	--	189
Santa Catalina	1568	956.3	1011.5	77	60	68.8	----	90	7	49	5	1	0	--	--	T	-----	T	0	0	.0	0	----	---	--	---	--	19	8	4	3.2	--	61
Santa Maria	231	1005.4	1014.1	71	52	61.4	----	85	18	43	6	0	0	53	79	.01	-----	.01	1	0	.0	0	5.8	W	*20	WSW	5	11	19	1	3.7	--	118
COLORADO																																	
Alamosa	7534	776.1	1016.8	86	48	67.1	----	91	16	39	9	5	0	--	--	.74	-----	.60	7	7	.0	0	----	---	--	---	--	14	15	2	4.2	--	10
Colorado Springs	6175	814.4	1014.4	85	57	71.3	----	96	7	43	1	12	0	50	55	4.42	-----	3.00	10	10	T	T	9.7	SE	--	---	--	13	10	8	5.0	--	16
Denver	5292	839.1	1013.3	88	59	73.5	+2.3	97	15	48	1	18	0	48	48	.83	-.64	.48	9	8	T	T	7.8	S	43	S	20	14	10	7	4.5	65	17
Grand Junction	4849	858.8	1010.3	94	64	79.4	+1.7	98	30	56	1	27	0	39	27	.19	-.42	.18	3	8	.0	0	9.3	ESE	42	NW	20	16	13	2	3.6	80	0
Pueblo	4799	857.8	1012.2	91	61	76.2	+2.0	102	7	50	1	21	0	52	50	1.90	-.04	1.45	8	7	.0	0	7.1	E	40	SW	17	14	12	5	4.1	65	0
CONNECTICUT																																	
Bridgeport	7	1014.9	1015.7	83	65	74.0	----	90	31	56	21	2	0	64	75	3.03	-----	1.14	8	10	.0	0	7.8	SW	*28	WNW	5	6	14	11	6.2	--	0
Hartford	15	1009.1	1014.9	84	63	73.6	+2.0	93	31	52	21	5	0	64	74	1.35	-3.02	.57	9	4	.0	0	6.9	S	24	S	°4	6	8	17	7.0	57	0
New Haven	6	1011.2	1015.2	81	64	72.4	+3.1	87	16	52	21	0	0	--	--	3.26	-.75	1.37	9	8	.0	0	6.2	---	33	NW	19	6	13	12	6.3	65	0
DELAWARE																																	
Wilmington	73	1012.5	1015.7	86	66	75.9	----	94	27	55	7	6	0	67	75	3.84	-----	1.98	8	7	.0	0	6.5	S	--	---	--	7	8	16	6.4	--	0
FLORIDA																																	
Apalachicola	13	1015.2	------	88	76	81.6	-.1	92	17	70	22	5	0	--	--	9.23	+1.49	1.77	16	20	.0	0	6.6	---	35	E	8	10	12	9	5.2	76	0
Daytona Beach	33	1015.9	1017.5	91	71	80.8	+.5	95	13	66	12	24	0	74	84	3.80	-1.69	1.28	12	18	.0	0	7.0	SSW	*25	SSE	24	8	18	5	5.0	--	0
Fort Myers	15	1016.6	1017.2	92	73	82.5	+1.1	97	16	69	22	30	0	73	81	11.44	+3.28	2.04	22	30	.0	0	6.4	E	--	---	--	1	23	7	6.4	--	0
Jacksonville CO	18	------	------	--	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	0
Jacksonville	52	1016.6	1017.3	93	73	83.0	-.1	102	14	67	12	25	0	71	74	6.69	-.02	2.72	14	17	.0	0	5.6	SW	38	W	28	7	12	12	5.9	57	0
Key West Co	5	1015.6	1016.3	91	78	84.6	+1.1	94	15	74	25	28	0	--	--	3.48	+.20	1.22	17	16	.0	0	6.4	---	25	SE	24	5	24	2	5.5	67	0
Key West	6	1015.9	1016.6	91	77	83.6	+.9	95	23	70	25	22	0	74	73	6.34	+3.06	1.87	17	17	.0	0	8.9	E	--	---	--	5	20	6	5.8	--	0
Lakeland CO	214	------	------	91	72	81.7	+.1	97	14	68	24	25	0	--	--	9.19	+1.25	1.96	19	30	.0	0	----	---	--	---	--	2	23	6	6.0	--	0
Melbourne	22	1016.6	1017.6	89	72	80.7	-.2	93	5	70	26	18	0	74	83	6.02	-.56	1.30	11	24	.0	0	6.2	S	*20	SW	14	3	23	5	5.9	--	0
Miami CO	180	------	------	86	76	80.7	-1.1	89	31	68	25	0	0	--	--	7.47	+1.87	1.68	19	18	.0	0	9.7	---	34	S	24	0	25	6	6.5	51	0
Miami	9	1013.9	1017.1	89	74	81.8	----	92	16	71	26	21	0	73	79	8.64	-----	3.49	17	18	.0	0	6.2	SE	25	W	29	1	17	13	6.7	--	0
Miami Beach CO	3	------	------	87	77	82.0	----	90	14	69	26	1	0	--	--	5.23	-----	1.70	15	--	.0	0	----	---	--	---	--	16	11	4	---	--	0
Orlando	111	1013.5	1017.7	92	72	81.8	-.1	95	13	67	10	23	0	73	81	14.51	+6.36	2.77	24	22	.0	0	7.8	S	40	SW	18	5	20	6	5.8	--	0
Pensacola	13	1014.2	1016.2	90	77	83.1	+2.1	96	6	72	14	14	0	74	--	8.11	+1.34	4.20	12	16	.0	0	5.5	S	26	SE	24	9	11	11	5.8	75	0
Tallahassee	64	1014.9	1017.2	92	73	82.2	----	99	15	69	9	25	0	72	77	5.57	-----	2.21	16	17	.0	0	4.5	SE	--	---	--	6	13	12	5.9	--	0
Tampa	24	1015.9	1017.3	92	73	82.5	+1.3	97	16	70	26	26	0	73	79	6.72	-1.23	1.97	19	29	.0	0	5.6	E	34	S	22	2	22	7	6.2	51	0
West Palm Beach	14	1016.3	1017.1	91	74	82.6	----	94	19	72	26	26	0	75	82	7.97	+1.91	2.48	19	23	.0	0	6.0	SE	--	---	--	1	18	12	7.2	--	0
GEORGIA																																	
Albany	190	1010.2	1017.2	96	73	84.2	+2.0	104	15	66	8	29	0	70	70	3.56	-2.49	1.12	13	15	.0	0	2.9	SSW	--	---	--	8	15	8	5.2	--	0
Atlanta CO	1054	------	------	89	70	79.3	+1.2	96	21	64	8	16	0	--	--	5.29	+.64	1.82	--	--	--	-	----	---	--	---	--	--	--	--	---	--	0
Atlanta	977	976.3	1016.8	89	69	79.1	.0	95	21	62	8	17	0	67	72	7.41	+2.57	2.07	12	13	.0	0	5.8	SW	33	W	26	10	13	8	5.1	79	0
Athens	798	988.2	------	90	69	78.9	----	97	14	61	°7	16	0	--	--	8.01	-----	2.82	13	13	.0	0	----	---	--	---	--	14	8	9	4.8	--	0
Augusta	426	1009.8	1016.4	93	69	81.4	+.1	101	13	55	7	26	0	69	73	4.74	-.84	1.45	14	15	.0	0	5.5	SE	22	SE	15	9	16	6	5.2	--	0
Columbus	382	1003.1	1016.9	92	71	81.2	----	98	16	63	8	21	0	69	73	3.99	-----	1.09	10	16	.0	0	5.4	S	--	---	--	12	12	7	5.1	--	0
Macon	354	1003.1	1016.5	93	71	81.8	----	101	15	62	8	24	0	70	71	6.96	-----	1.66	13	18	.0	0	7.2	SSW	42	SE	17	11	13	7	5.0	82	0
Rome	637	994.2	1017.0	92	67	79.4	----	98	20	56	8	20	0	69	77	3.29	-----	.76	11	14	.0	0	5.7	N	--	---	--	13	13	5	4.9	--	0
Savannah	38	1014.6	1016.9	91	71	81.2	+.3	101	14	64	9	22	0	71	77	10.17	+3.53	2.23	17	19	.0	0	6.6	SW	51	SE	16	4	19	8	6.2	50	0
Valdosta	200	1008.8	1016.9	94	70	82.1	+.7	103	16	63	9	27	0	70	--	3.75	-2.62	1.26	12	17	.0	0	7.0	SW	--	---	--	3	20	8	6.0	--	0
IDAHO																																	
Boise	2842	916.4	1009.8	92	60	75.7	+3.2	103	23	48	6	20	0	45	36	.29	+.05	.27	2	4	.0	0	6.9	NW	56	S	24	21	9	1	2.6	90	1
Lewiston	1413	961.7	1012.2	91	58	74.3	----	104	17	48	6	18	0	45	38	.35	-----	.28	4	3	.0	0	4.1	NE	--	---	--	26	1	4	2.1	--	10
Pocatello	4444	862.9	1012.2	89	55	72.3	+2.1	101	18	42	12	14	0	41	37	.28	-.49	.24	3	3	.0	0	7.5	W	38	SW	7	19	7	5	3.0	73	12
ILLINOIS																																	
Cairo CO	314	1003.1	1015.6	90	72	81.2	+.6	97	22	63	6	18	0	--	--	2.22	-.85	1.35	9	6	.0	0	6.0	---	34	N	9	2	15	14	7.1	73	0
Chicago	618	993.2	1015.6	83	62	72.6	-.1	91	26	53	6	4	0	61	70	4.96	+1.53	2.42	11	9	.0	0	6.4	S	34	NW	8	11	8	12	5.7	66	0
Joliet	580	994.2	1015.8	83	59	71.2	-2.8	92	27	47	6	4	0	63	76	5.46	+2.47	3.54	11	5	.0	0	7.5	N	--	---	--	10	9	12	5.5	--	3
Moline	589	994.2	1016.4	83	63	72.9	-.6	92	21	52	5	3	0	64	75	5.60	+2.27	1.36	12	8	T	0	7.0	NE	38	NE	8	8	12	11	5.7	66	3
Peoria	659	993.9	1015.8	83	64	73.8	-1.4	93	21	51	5	3	0	65	76	5.81	+2.23	2.77	9	11	.0	0	8.4	S	42	N	16	9	13	9	5.5	67	1
Springfield CO	----	------	------	---	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	0
Springfield	598	992.6	1015.4	84	66	74.9	+.9	92	21	54	1	4	0	67	78	1.66	-1.20	.90	6	10	.0	0	9.0	SSW	33	W	9	7	14	10	5.8	75	0

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	1000.7	1016.1	88	68	78.0	+1.5	95	22	52	6	15	0	69	77	2.83	-0.59	1.07	10	8	0.0	0	7.0	NW	38	NW	9	6	14	11	6.1	77	1
Fort Wayne	801	985.4	1016.2	83	62	72.2	-.2	89	26	51	6	0	0	64	77	6.34	+2.74	2.44	12	9	.0	0	6.5	SW	26	S	9	8	10	13	5.9	75	0
Indianapolis CO	----	------	------	--	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	-	---	-	---	---	--	---	-	-	--	--	----	--	0
Indianapolis	796	987.1	1016.3	85	64	74.1	-.2	90	26	51	6	2	0	65	77	3.12	-.22	1.87	8	7	.0	0	8.6	SW	36	NW	4	7	12	12	6.0	76	0
South Bend	768	987.8	1015.6	82	60	70.9	-2.7	89	26	49	6	0	0	62	75	5.01	+1.91	2.40	7	7	T	T	8.6	SSW	*45	NNW	27	10	9	12	5.9	--	2
Terre Haute	585	995.6	1016.1	86	65	75.1	-1.5	92	26	52	6	5	0	67	78	5.55	+2.37	1.94	11	12	.0	0	6.0	S	30	NW	4	8	14	9	5.7	75	0
IOWA																																	
Burlington	605	990.5	1015.8	83	64	73.5	-2.3	92	21	53	1	5	0	66	79	6.79	+3.22	2.23	11	14	.0	0	7.1	NE	35	NW	26	6	13	12	5.8	60	1
Charles City CO	1013	979.3	1015.6	80	61	70.6	-1.7	89	7	49	5	0	0	--	--	4.22	+.45	1.37	10	7	.0	0	5.1	---	22	SW	21	12	12	7	5.3	58	14
Davenport CO	579	994.2	------	83	65	74.1	-1.2	91	27	55	5	3	0	--	--	5.75	+2.42	2.10	8	8	.0	0	---	---	--	---	--	--	--	--	---	--	0
Des Moines	800	984.8	1015.9	84	64	73.6	-.8	92	20	52	1	6	0	65	76	4.46	+.96	2.68	12	9	T	T	9.2	S	40	N	17	8	12	11	6.0	60	3
Dubuque	641	977.0	1015.7	80	60	69.9	----	90	27	48	1	1	0	63	80	7.01	-----	4.36	8	6	.0	0	8.8	SSW	*29	NNE	8	12	7	12	5.5	--	17
Sioux City	1097	974.3	1014.7	84	62	72.8	-.5	96	20	47	1	11	0	63	76	2.99	-.55	.92	10	12	T	T	7.8	S	40	N	26	12	11	8	4.9	72	17
KANSAS																																	
Concordia CO	1375	965.8	1014.6	84	66	75.3	-2.7	96	16	55	1	11	0	--	--	6.14	+2.36	2.36	8	13	T	T	6.8	---	26	SE	5	7	11	13	6.3	50	0
Dodge City	2594	926.9	1012.5	88	67	77.6	-.8	100	20	57	1	16	0	64	69	5.42	+2.28	3.37	12	13	T	T	12.6	SSE	78	SW	4	9	13	9	5.3	64	0
Goodland	3645	889.6	1013.6	84	61	72.8	-3.8	98	20	51	13	13	0	62	75	4.58	+1.91	1.95	8	14	T	T	10.5	SE	*48	WNW	21	12	8	11	5.3	--	24
Topeka CO	----	------	------	--	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	0
Topeka	926	979.0	1014.2	86	67	76.5	----	103	21	54	1	12	0	68	78	11.57	-----	4.19	12	12	T	T	7.8	S	37	SW	8	8	6	17	6.5	43	0
Wichita	1372	966.8	1014.2	88	70	78.7	-.7	102	21	60	1	13	0	68	75	4.45	+1.07	2.69	9	11	.0	0	11.6	S	36	SE	10	8	15	8	5.5	65	0
KENTUCKY																																	
Lexington	979	981.4	1016.7	89	66	77.4	+1.5	96	31	51	6	14	0	64	68	1.83	-1.82	1.31	10	8	.0	0	7.1	SSW	--	---	--	7	14	10	5.9	--	0
Louisville CO	----	------	------	--	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	0
Louisville	485	1000.7	1015.9	89	67	77.7	+.1	94	30	53	6	15	0	65	73	2.89	-.81	.99	10	8	.0	0	6.0	S	31	SE	3	6	14	11	6.1	68	0
LOUISIANA																																	
Baton Rouge	64	1014.9	1015.8	92	73	82.4	+.7	99	20	69	14	23	0	73	82	7.44	+.60	2.90	13	12	.0	0	5.1	SE	--	---	--	7	15	9	5.5	--	0
Lake Charles	12	1014.2	1015.4	94	74	84.2	+2.1	100	19	69	5	30	0	73	80	1.94	-4.33	.73	10	14	.0	0	6.4	S	--	---	--	4	19	8	5.9	--	0
New Orleans CO	12	1013.9	------	92	77	84.4	+2.0	99	19	74	14	24	0	--	--	4.92	-1.45	1.04	20	17	.0	0	4.9	---	19	SW	8	5	21	5	5.6	53	0
New Orleans	12	1013.9	1015.9	92	75	83.2	----	99	19	70	14	23	0	74	80	3.45	-----	.88	15	17	.0	0	5.7	S	*26	NE	30	9	16	6	5.2	--	0
Shreveport	174	1004.4	1015.0	95	74	84.6	+1.4	100	22	68	1	29	0	73	75	3.30	-.26	1.39	8	10	T	0	7.3	SE	36	NE	1	14	11	6	4.5	84	0
MAINE																																	
Caribou	624	989.9	1012.8	74	53	63.7	-.9	86	10	44	18	0	0	55	76	6.83	+2.89	2.82	16	4	T	0	10.6	SW	*30	WNW	29	4	13	14	6.8	--	77
Eastport	33	1010.8	1013.5	71	55	62.8	+2.4	81	24	51	8	0	0	--	--	4.28	+1.20	1.30	11	6	.0	0	7.5	---	22	SE	19	10	12	9	5.4	65	77
Portland	61	1009.8	1013.7	80	58	68.7	+3.0	91	16	51	2	1	0	61	78	5.87	+2.63	1.87	11	4	.0	0	7.3	NW	25	NW	16	7	11	13	6.0	65	10
MARYLAND																																	
Baltimore CO	14	------	------	87	71	79.0	+1.8	95	22	60	6	8	0	--	--	3.11	-1.53	1.02	9	--	---	-	----	---	--	---	--	--	--	--	---	--	0
Baltimore	146	1010.2	1016.2	88	67	77.3	----	96	°22	59	°6	11	0	66	71	1.84	-----	1.05	8	7	.0	0	8.9	S	43	NW	5	7	18	6	5.7	56	0
Frederick	294	------	------	89	65	77.2	----	96	°23	54	21	14	0	--	--	2.59	-----	1.84	8	2	.0	0	----	---	--	---	--	--	--	--	---	--	0
MASSACHUSETTS																																	
Boston	12	1009.8	1014.5	83	66	74.0	+2.3	92	16	60	21	3	0	60	66	2.13	-1.36	.68	10	6	.0	0	10.3	SW	29	NW	6	9	8	14	6.3	64	0
Nantucket	43	1014.6	1015.2	76	62	69.4	+1.6	83	27	57	25	0	0	64	85	1.45	-1.42	.65	6	5	.0	0	9.1	SW	26	NW	6	7	10	14	6.5	61	0
Pittsfield	1153	972.9	1014.6	78	56	67.3	-.2	85	16	45	21	0	0	--	--	4.08	-.11	1.53	10	7	.0	0	6.6	---	--	---	--	8	9	14	6.3	--	21
MICHIGAN																																	
Alpena CO	587	992.9	1015.2	76	58	66.7	+.8	87	25	49	2	0	0	--	--	4.92	+2.16	2.28	13	8	.0	0	8.7	---	32	E	4	8	12	11	5.8	72	44
Detroit	619	989.2	1015.2	83	63	72.7	+1.7	92	26	54	20	4	0	60	67	4.10	+.78	2.02	10	8	.0	0	8.3	W	34	NW	4	11	7	13	5.6	66	1
Escanaba CO	594	992.2	1014.2	75	58	66.2	+.2	87	25	49	5	0	0	--	--	9.93	+6.60	3.50	15	11	.3	T	9.3	---	42	SE	8	10	9	12	5.6	64	48
Grand Rapids CO	----	------	------	--	--	----	-----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	0
Grand Rapids	638	990.9	1015.6	81	59	70.0	+.1	89	26	47	20	0	0	59	71	.56	-2.36	.42	5	4	.0	0	6.4	W	35	W	8	10	10	11	5.5	68	8
Lansing	859	984.1	1015.7	81	59	70.3	-1.3	91	26	48	20	2	0	60	71	1.07	-2.03	.46	9	4	.0	0	8.2	WSW	28	S	8	12	8	11	5.4	67	5
Marquette CO	677	987.5	1014.2	75	57	66.0	+1.1	91	29	46	4	2	0	--	--	4.32	+1.20	1.54	14	10	.0	0	7.1	---	28	S	21	8	14	9	5.6	74	80
Muskegon	627	992.6	1015.4	78	58	67.9	-1.6	86	27	46	20	0	0	59	74	.47	-1.86	.24	7	2	.0	0	7.8	SW	*42	WNW	8	11	9	11	5.3	--	14
Sault Ste. Marie	721	991.9	1014.6	73	51	62.1	-.6	84	26	38	3	0	0	55	78	2.81	+.12	.93	11	7	.0	0	7.6	SW	38	S	8	10	11	10	5.7	55	120
Ypsilanti	722	987.5	1015.3	83	62	72.6	----	91	26	53	20	1	0	60	67	4.85	-----	3.17	6	6	.0	0	9.0	SW	*25	W	1	11	7	13	5.7	--	1
MINNESOTA																																	
Duluth	1128	973.6	1014.6	76	54	64.8	----	88	25	45	17	0	0	56	74	3.68	-----	1.08	13	11	.0	0	11.2	W	33	NW	21	9	15	7	5.1	73	88
Intern'l Falls	1179	971.6	1014.1	77	51	64.1	-3.0	91	24	41	11	3	0	54	72	2.05	-1.38	.75	8	7	.0	0	----	---	--	---	--	10	11	10	5.4	--	81
Minneapolis	830	982.1	1015.0	82	62	71.8	-.5	91	15	51	1	3	0	60	69	5.44	+1.71	2.97	12	7	.0	0	9.8	SW	92	W	20	12	12	7	4.7	68	5
Rochester	1014	979.0	1015.5	82	59	70.5	-1.4	92	7	46	5	1	0	60	72	8.14	+4.87	4.51	13	7	.0	0	8.1	NW	--	---	--	8	13	10	5.5	--	12
St. Cloud	1034	977.0	1014.5	81	57	69.2	-2.2	92	15	46	1	5	0	59	72	4.73	+1.18	2.26	9	7	.0	0	6.8	WNW	-	---	--	11	11	9	5.1	--	16
St. Paul	703	988.5	1014.4	82	62	71.8	-.3	92	15	52	1	4	0	59	68	5.94	+2.37	3.03	12	8	T	T	8.7	SE	*45	NNE	20	11	13	7	5.0	--	1
MISSISSIPPI																																	
Jackson	315	1004.4	1016.2	95	73	83.7	+2.1	101	21	69	14	29	0	72	74	3.30	-1.24	1.12	11	10	.0	0	5.7	SE	25	NW	14	14	12	5	4.5	67	0
Meridian	294	1002.7	1014.7	95	71	82.8	+3.1	100	18	66	11	30	0	71	76	1.44	-3.45	.49	10	9	.0	0	5.5	SW	--	---	--	11	16	4	4.7	--	0
Vicksburg	234	1008.5	------	91	73	82.4	+1.1	96	20	69	2	27	0	--	--	3.53	-1.00	1.53	7	8	.0	0	6.6	---	25	W	2	10	15	6	5.2	71	0
MISSOURI																																	
Columbia	733	987.5	1015.3	86	67	76.4	-.7	93	21	56	1	11	0	69	80	5.19	+1.70	1.58	10	12	T	T	7.4	S	36	NW	23	6	13	12	6.1	67	4
Kansas City	741	980.7	1014.7	86	69	77.5	-.6	97	21	60	1	14	0	68	75	7.54	+3.72	2.24	10	12	.0	0	6.8	SSW	40	NE	16	9	11	11	5.8	64	1
St. Joseph	809	980.4	1014.6	86	67	76.4	-1.0	95	20	56	1	13	0	68	78	5.72	+1.94	1.91	12	11	.0	0	8.1	E	34	NE	16	7	14	10	5.6	66	2
St. Louis CO	465	994.9	------	87	71	79.0	+.2	95	22	61	1	15	0	--	--	3.38	+.40	1.06	8	7	.0	0	9.5	---	35	SW	9	6	13	12	6.3	67	0
St. Louis	465	994.9	1015.1	88	69	78.2	+.4	96	22	57	6	14	0	68	75	2.95	+.29	.89	7	6	.0	0	6.0	E	--	---	--	7	10	14	6.5	--	1
Springfield	1265	969.2	1015.6	86	68	76.6	+.4	94	21	55	1	10	0	70	84	6.15	+1.94	3.80	10	11	T	T	9.6	SSE	42	N	3	6	11	14	6.6	59	0
MONTANA																																	
Billings	3568	891.6	1012.9	86	58	71.8	-.2	99	18	42	11	17	0	47	46	.64	-----	.53	6	6	.0	0	9.3	SW	37	W	°6	17	6	8	4.1	72	54
Butte	5530	832.0	1016.9	80	43	61.9	-2.0	94	18	32	11	4	1	39	50	.59	-.79	.30	7	9	.0	0	7.8	NW	--	---	--	14	12	5	4.3	--	133
Glasgow CO	2090	940.1	1013.2	89	55	71.9	+.7	108	28	42	10	14	0	49	50	.87	-.52	.43	7	5	.0	0	----	---	--	---	--	20	6	5	3.1	--	26
Great Falls	3664	888.9	1013.7	81	55	68.2	-1.0	96	27	43	11	7	0	46	49	2.54	+1.03	1.00	9	6	T	T	9.6	WSW	73	W	5	18	7	6	3.6	79	61
Havre CO	2488	926.2	1013.9	85	56	70.3	+2.0	103	27	45	11	11	0	--	-	.99	-.88	.30	7	4	.0	0	7.5	---	50	S	5	19	7	5	3.2	86	28
Helena	3893	874.7	1014.2	84	51	67.5	+1.8	98	18	41	11	13	0	47	53	1.81	+.67	.74	8	11	T	T	6.2	W	48	SW	5	17	7	7	4.1	80	56
Kalispell	2965	911.6	1013.1	82	48	65.1	----	93	27	39	5	9	0	47	57	1.08	-----	.35	6	4	.0	0	6.6	S	--	---	--	20	8	3	2.9	--	77
Miles City	2629	930.6	1013.0	88	59	73.7	----	103	24	42	11	16	0	53	--	1.56	-----	1.10	6	3	.0	0	9.0	SSE	--	---	--	17	8	6	3.8	--	45
Missoula	3201	902.1	1014.3	85	49	67.1	+.3	98	27	39	11	14	0	46	52	.92	+.12	.30	10	10	T	T	5.8	NW	43	SW	24	18	8	5	3.4	75	67
NEBRASKA																																	
Grand Island	1841	949.2	1014.0	84	62	72.7	----	96	20	52	1	9	0	62	73	1.96	-----	.76	12	7	.0	0	11.4	S	--	---	--	15	6	10	4.6	--	19
Lincoln CO	1184	972.6	------	85	65	74.7	-1.8	96	20	54	1	10	0	--	--	3.58	-.27	1.17	10	9	T	T	7.7	---	60	N	27	12	10	9	---	64	3
Lincoln	1180	972.6	1014.7	85	63	74.0	-2.0	96	16	51	1	11	0	64	--	2.97	-.88	1.04	10	8	T	T	8.6	SE	--	---	--	12	10	9	4.8	--	7
Norfolk	1554	960.0	1014.9	83	62	72.5	-3.2	96	20	49	1	11	0	62	74	3.83	+.42	1.34	8	11	.0	0	9.8	SSW	--	---	--	17	6	8	4.1	--	21
North Platte	2783	917.0	1013.9	81	60	70.7	-2.2	98	20	48	13	7	0	61	76	5.47	+2.73	1.45	12	11	.0	0	9.2	SE	50	N	15	8	12	11	5.7	53	37
Omaha	978	976.0	1014.9	85	65	74.7	-.5	97	20	52	1	10	0	65	74	4.08	+.54	1.65	13	9	T	T	8.8	SSE	43	E	17	10	11	10	5.2	71	5
Scottsbluff	3950	880.5	1013.3	86	59	72.1	-1.2	100	7	49	11	13	0	55	65	1.85	+.12	.73	9	10	.0	0	8.8	ESE	--	---	--	15	10	6	4.0	--	27
Valentine CO	2581	924.8	1015.2	82	60	71.1	-2.6	99	19	49	4	13	0	--	--	4.01	+1.00	1.14	13	12	T	0	8.3	---	32	W	29	9	12	10	5.3	66	53

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
NEVADA																																	
Elko	5075	845.2	1012.7	90	48	69.1	----	100	18	37	11	17	0	42	40	0.73	-----	0.48	3	6	0.0	0	6.5	SW	--	---	--	21	6	4	2.6	--	21
Ely	6257	811.7	1014.2	87	48	67.3	+3.8	94	18	38	8	11	0	--	--	1.33	+.71	.68	7	9	T	0	10.3	---	46	SW	15	15	10	6	3.7	79	4
Las Vegas	2162	933.6	1007.2	105	75	90.1	+3.0	111	18	66	12	31	0	38	23	.54	+.01	.22	5	6	.0	0	7.4	SW	--	---	--	20	8	3	2.7	81	0
Reno	4397	861.8	1012.1	92	48	70.0	+1.9	98	17	37	4	23	0	40	38	.00	-.25	.00	0	1	.0	0	5.2	WNW	35	SW	5	25	5	1	1.5	95	15
Winnemucca	4299	872.0	1011.5	93	50	71.5	+.9	100	18	34	6	24	0	31	23	.07	-.14	.07	1	1	.0	0	8.0	---	33	W	3	23	5	3	2.1	95	5
NEW HAMPSHIRE																																	
Concord	339	1003.7	1014.3	82	57	69.4	+2.0	90	7	46	7	2	0	60	73	5.62	+2.06	1.86	8	4	.0	0	4.1	SE	26	NW	16	7	8	16	6.6	70	9
Mt. Washington	6262	808.3	1020.0	54	43	48.5	-.7	67	11	31	6	0	1	--	93	10.22	+4.12	2.14	22	4	T	0	25.3	W	**77	W	20	2	5	24	8.5	19	504
NEW JERSEY																																	
Atlantic City CO	8	1013.5	1015.2	80	69	74.7	+2.6	92	23	60	6	1	0	--	--	1.86	-2.07	1.00	5	4	.0	0	13.1	---	40	E	17	8	12	11	6.0	72	0
Newark	11	1014.2	1015.4	86	66	76.1	+1.3	96	27	58	21	9	0	64	68	4.83	+.12	3.36	10	8	.0	0	7.9	SW	*37	W	19	6	13	12	6.4	--	0
Trenton CO	56	1008.8	1015.6	85	67	75.8	+1.3	94	27	59	6	4	0	--	--	2.51	-1.43	1.01	17	6	.0	0	7.9	---	39	W	19	10	7	14	6.2	68	0
NEW MEXICO																																	
Albuquerque	5310	849.0	1009.1	96	69	82.6	+5.9	102	9	63	1	27	0	45	31	.85	-.56	.76	8	11	.0	0	8.7	SE	56	E	30	14	14	3	4.0	74	0
Clayton	4969	849.6	1012.9	88	61	74.6	+.5	96	20	52	1	16	0	59	64	3.07	+.53	1.05	9	16	T	T	11.9	SSW	--	---	--	15	10	6	4.4	--	0
Raton	6379	808.3	1013.4	87	55	71.1	----	95	9	49	8	14	0	50	54	2.96	-----	.83	14	23	T	T	8.3	S	--	---	--	10	12	9	5.3	--	3
Roswell	3611	893.0	1010.7	98	68	83.0	+4.1	108	8	63	2	29	0	55	43	1.59	-.67	.54	6	8	.0	0	9.5	SSE	47	SE	1	14	12	5	4.0	79	0
NEW YORK																																	
Albany	277	1010.2	1014.1	82	61	71.5	+.6	90	26	49	21	2	0	61	72	4.29	+1.48	1.09	13	6	T	T	7.0	S	33	S	4	6	9	16	6.8	58	1
Bear Mountain	1300	------	------	78	63	70.3	----	85	31	55	20	0	0	--	--	5.07	-----	1.82	10	9	.0	0	----	---	--	---	--	8	8	15	6.5	--	5
Binghamton	1601	957.3	1015.7	78	60	69.1	----	86	26	49	20	0	0	59	73	3.19	-----	1.35	9	10	.0	0	9.1	WNW	37	SW	9	5	12	14	6.9	62	20
Buffalo	693	987.5	1015.8	80	61	70.4	+.4	86	29	54	20	0	0	59	71	3.50	+.47	.79	10	7	T	T	12.5	SW	35	NW	5	6	11	14	6.3	60	6
New York CO	10	1004.1	------	83	68	75.4	+1.6	92	27	60	6	1	0	--	--	5.10	+.86	3.36	10	8	T	0	11.4	---	50	NW	6	8	10	13	6.3	68	0
New York	19	1013.5	1015.5	84	69	76.6	----	95	27	63	6	4	0	62	66	3.89	-----	2.66	9	7	T	0	9.7	S	49	NW	27	6	12	13	6.5	--	0
Oswego	292	1002.0	1014.2	77	63	69.7	+.5	87	9	55	21	0	0	--	--	3.62	+.70	1.70	16	7	.0	0	7.1	---	26	N	5	10	12	9	5.1	67	3
Rochester	543	995.9	1015.0	81	60	70.8	+.1	90	30	51	20	1	0	59	71	4.08	+1.12	1.30	10	4	.0	0	8.4	SW	28	W	26	9	12	10	5.9	62	7
Syracuse	399	993.2	1014.8	81	61	71.1	+1.8	89	9	56	20	0	0	61	73	5.22	+1.54	1.64	16	8	.0	0	8.2	W	47	NW	19	6	9	16	6.7	50	3
NORTH CAROLINA																																	
Asheville CO	2203	------	------	86	63	74.5	+2.8	92	14	52	7	6	0	--	--	2.75	-1.55	.73	13	12	.0	0	5.1	---	22	NW	5	5	18	8	5.8	69	0
Asheville	2093	945.1	1017.0	---	--	----	----	---	--	--	--	--	-	65	80	-----	-----	----	--	--	--	-	3.8	NW	--	---	--	--	--	--	---	--	0
Charlotte	753	989.5	1016.8	91	68	79.4	+2.3	98	13	59	7	21	0	66	70	1.88	-3.22	.84	8	10	.0	0	5.7	S	34	NW	24	8	13	10	5.7	79	0
Greensboro	891	986.1	1017.4	89	66	77.5	+.3	95	23	55	7	17	0	66	72	2.40	-2.72	.97	9	8	.0	0	6.4	SW	38	NW	18	12	11	8	4.8	71	0
Hatteras	4	1016.3	1016.8	84	74	78.9	+.7	87	15	66	7	0	0	72	80	1.74	-3.75	1.15	10	11	.0	0	6.3	SSW	30	SW	5	10	9	12	5.6	71	0
Raleigh CO	400	------	------	91	69	80.1	+1.3	101	13	60	7	23	0	--	--	6.77	+1.37	4.27	12	9	T	0	4.4	---	21	SW	19	9	16	6	5.3	57	0
Raleigh	438	1001.0	1016.5	91	67	79.3	----	98	13	55	7	20	0	67	73	4.69	-----	1.08	9	12	.0	0	5.7	SW	--	---	--	12	13	16	4.5	--	0
Wilmington CO	6	1015.2	1016.6	87	72	79.5	+.5	96	13	65	6	4	0	--	--	10.53	+3.40	3.22	14	13	.0	0	7.5	---	29	W	1	5	12	14	6.9	46	0
Wilmington	30	1015.4	1016.8	---	--	----	----	---	--	--	--	--	-	72	--	-----	-----	----	--	--	--	-	5.1	SW	--	---	--	--	--	--	---	--	0
Winston-Salem	967	982.4	1017.1	90	67	78.4	+.9	98	22	59	7	16	0	65	67	5.41	+.54	1.30	12	10	.0	0	7.0	NE	--	---	--	13	15	3	4.2	--	0
NORTH DAKOTA																																	
Bismarck	1653	954.6	1014.0	83	57	69.9	+.5	99	14	43	10	6	0	57	68	3.84	+1.60	1.42	11	10	.0	0	8.9	SSE	47	N	7	10	13	8	5.0	75	33
Devils Lake CO	1471	961.4	1014.2	82	54	68.2	+.8	97	24	42	10	6	0	--	--	2.09	-.48	1.45	7	7	.0	0	7.9	---	34	NW	7	12	16	3	4.3	74	46
Fargo	895	980.0	1013.8	81	56	68.5	+.4	93	14	43	10	4	0	57	68	3.77	+.34	1.86	10	6	.0	0	10.4	SSE	50	W	24	18	6	7	4.3	71	35
Williston CO	1877	946.8	1013.3	84	57	70.6	+1.7	100	27	41	10	9	0	51	56	1.02	-.87	.51	7	6	T	0	7.4	---	40	SE	28	13	12	6	4.3	88	38
OHIO																																	
Akron	1210	972.2	1016.5	82	59	70.8	-1.8	89	30	49	6	0	0	60	71	3.90	+.05	1.10	11	7	.0	0	7.3	NW	--	---	--	10	10	11	5.5	--	9
Cincinnati OBS	761	------	------	88	66	76.5	+1.4	95	31	56	6	12	0	--	--	2.03	-1.28	.95	7	3	.0	0	4.9	---	19	S	9	--	--	--	---	61	0
Cincinnati	871	984.8	1016.1	88	64	76.0	----	96	26	51	6	13	0	63	67	1.18	-----	.76	6	2	.0	0	8.0	SSW	--	---	--	11	9	11	5.4	--	0
Cleveland CO	----	------	------	---	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	1
Cleveland	787	988.5	1015.9	85	62	73.6	+1.7	93	25	53	6	8	0	61	67	3.47	+.02	.88	9	5	.0	0	9.0	S	40	NW	5	12	9	10	5.0	76	0
Columbus CO	----	------	------	---	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	0
Columbus	815	986.5	1016.1	86	62	74.2	+1.1	94	31	49	6	9	0	62	69	.99	-2.87	.56	8	7	.0	0	5.9	NW	26	NW	4	10	10	11	5.5	63	0
Dayton	1002	980.7	1016.3	85	64	74.3	-.6	91	21	54	20	4	0	63	70	.84	-2.45	.33	7	7	.0	0	8.1	S	29	W	°4	9	9	13	5.9	70	0
Sandusky	603	993.6	------	84	65	74.5	+1.1	92	°26	58	6	4	0	--	--	2.94	-.50	1.13	7	5	.0	0	6.6	---	24	NW	4	13	9	9	4.8	74	0
Toledo	621	993.2	1015.9	83	62	72.6	+.8	91	30	52	20	2	0	62	73	2.11	-.91	.85	9	6	.0	0	8.4	SW	47	SW	8	10	9	12	5.7	58	0
Youngstown	1178	974.3	1016.0	82	59	70.7	-.3	88	30	49	6	0	0	60	72	4.96	+1.46	1.38	13	8	T	0	7.0	N	*35	NW	19	9	10	12	5.7	--	7
OKLAHOMA																																	
Oklahoma City CO	1254	------	------	---	--	----	----	---	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	3
Oklahoma City	1254	968.2	1013.9	92	72	81.5	+.9	98	21	57	1	24	0	69	72	3.15	+.29	1.01	9	7	.0	0	12.9	SSE	46	S	2	14	13	4	4.3	76	2
Tulsa	672	990.5	1014.1	92	72	81.7	+.6	100	21	61	1	24	0	71	74	3.26	-1.12	1.35	7	9	.0	0	9.1	S	35	NW	26	10	11	10	5.1	79	0
OREGON																																	
Baker	3369	------	------	---	--	----	----	---	--	--	--	--	-	44	--	-----	-----	----	--	--	--	-	6.9	NNW	--	---	--	--	--	--	---	--	-
Baker CO	3446	894.7	1013.6	86	51	68.9	+3.3	99	17	41	6	16	0	--	--	.22	-.36	.17	4	3	.0	0	6.4	---	40	SW	5	26	3	2	1.7	94	35
Burns CO	4140	872.7	1012.5	88	52	69.8	+3.2	97	23	43	6	15	0	39	34	.20	-.24	.20	1	1	.0	0	----	---	--	---	--	25	5	1	1.5	--	15
Eugene	364	1002.7	1016.3	83	51	67.2	----	102	11	45	30	5	0	51	63	.01	-----	.01	1	0	.0	0	8.6	N	--	---	--	18	10	3	2.9	--	14
Meacham	4050	877.4	1015.5	80	50	65.0	----	94	23	40	7	2	0	39	43	.11	-----	.09	3	3	T	0	5.9	WNW	--	---	--	24	3	4	2.3	--	79
Medford	1314	966.5	1013.1	90	55	72.8	+.1	100	11	44	6	21	0	47	44	T	-.30	T	0	0	.0	0	7.3	NW	*25	N	28	25	5	1	1.3	--	7
Pendleton	1489	960.4	1013.0	88	59	73.7	+2.3	99	23	52	10	17	0	45	38	.24	-.17	.16	3	3	.0	0	9.4	NW	--	---	--	27	3	1	1.3	--	8
Portland CO	30	------	------	79	58	68.2	+1.5	94	11	53	26	1	0	--	--	.13	-.48	.13	1	0	.0	0	----	---	--	---	--	--	--	--	---	--	15
Portland	21	1014.9	1016.3	78	56	67.1	+1.6	93	11	48	26	1	0	53	67	.28	-----	.16	4	0	.0	0	6.2	NNW	26	SE	11	15	11	5	3.9	71	18
Roseburg CO	479	997.3	1015.6	84	55	69.4	+2.0	101	11	48	6	5	0	--	--	T	-.32	T	0	0	.0	0	5.2	---	19	W	5	21	6	4	2.9	84	10
Salem	195	1008.8	1016.2	84	51	66.7	-.3	99	11	45	26	4	0	50	63	.17	-.22	.17	1	0	.0	0	6.7	NW	--	---	--	18	9	4	3.4	--	20
Sexton Summit CO	3836	------	------	78	51	64.5	----	87	30	40	6	0	0	--	--	T	-----	T	0	0	.0	0	----	---	--	---	--	26	3	2	1.5	--	69
Troutdale	29	------	------	81	54	67.4	----	94	12	45	26	3	0	--	--	.18	-----	.08	3	0	.0	0	----	---	--	---	--	15	11	5	4.3	--	30
PENNSYLVANIA																																	
Allentown	381	1002.0	1016.1	83	63	72.6	-1.6	91	27	52	°7	1	0	64	75	5.98	+1.37	2.60	9	8	T	0	5.4	SSW	--	---	--	8	10	13	5.9	--	0
Curwensville	2215	------	------	78	56	67.0	----	85	27	43	6	0	0	60	79	3.85	-----	1.30	12	7	.0	0	7.4	WNW	*22	W	4	7	7	17	6.6	--	38
Erie CO	655	------	------	79	65	72.1	+1.1	87	8	58	5	0	0	--	--	2.13	-.88	.88	10	6	.0	0	6.7	---	23	SW	8	12	13	6	4.7	63	0
Harrisburg	335	1002.0	1015.4	85	65	75.1	+.3	94	27	54	21	8	0	63	68	1.16	-2.67	.72	9	9	T	T	6.1	W	32	NW	19	7	12	12	6.1	64	0
Park Place	1932	------	------	78	61	69.4	----	87	16	51	6	0	0	--	--	6.93	-----	3.92	9	5	.0	0	----	---	--	---	--	10	9	12	5.8	--	14
Philadelphia CO	26	------	------	85	69	77.3	+1.1	94	27	61	6	3	0	--	--	2.38	-1.77	1.38	6	5	T	0	6.7	---	34	NW	19	7	9	15	6.5	65	0
Philadelphia	13	1011.2	1015.5	86	68	77.0	+1.7	95	27	58	7	8	0	66	71	2.24	-1.91	.87	5	6	.0	0	8.1	WSW	40	NNW	19	3	14	14	6.9	--	0
Pittsburgh CO	749	------	------	85	66	75.5	+.9	93	31	54	6	5	0	--	--	3.90	-.15	2.58	--	--	T	-	----	---	--	---	--	--	--	--	---	36	1
Pittsburgh	1248	986.1	1016.3	84	64	73.9	+.9	90	21	52	6	3	0	61	67	3.48	-.57	1.55	5	6	.0	0	7.1	S	34	W	22	6	13	12	6.0	62	3
Reading CO	266	1005.1	1015.2	86	67	76.1	+.9	95	27	57	°7	7	0	--	--	4.70	+.44	1.43	6	5	.0	0	8.2	---	66	W	19	7	9	15	6.1	59	0
Scranton CO	746	986.5	1014.9	83	63	72.7	+1.0	90	16	50	21	2	0	--	--	5.18	+1.15	1.54	10	9	.0	0	5.2	---	26	NW	6	7	13	11	6.1	56	1
Williamsport	527	996.6	1015.4	86	61	73.4	+.1	95	30	49	21	8	0	61	71	1.55	-2.20	1.00	8	6	.0	0	6.0	W	*78	SSW	10	8	10	13	6.0	--	0
RHODE ISLAND																																	
Block Island	356	1011.2	1015.3	77	64	70.7	+2.3	87	27	56	21	0	0	--	--	.79	-2.29	.51	6	6	.0	0	----	---	--	---	--	9	12	10	5.9	--	0
Providence CO	12	------	------	84	65	74.2	+.8	92	16	58	6	7	0	--	--	2.38	-.89	1.78	8	5	.0	0	----	---	--	---	--	--	--	--	---	--	0
Providence	55	1009.1	1015.1	82	64	72.5	+.1	89	16	55	21	0	0	63	74	.91	-2.36	.30	8	5	.0	0	7.9	SW	29	SW	5	8	9	14	6.2	67	0

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1015.2	------	87	75	81.2	-0.2	94	5	69	8	9	0	--	--	5.75	-1.14	2.17	14	21	0.0	0	9.0	---	53	N	24	7	13	11	5.8	64	0
Charleston	41	1016.9	1017.0	90	71	80.3	+.3	98	13	60	9	16	0	71	80	6.26	-.94	1.92	15	19	.0	0	6.5	SW	--	---	--	5	16	10	6.2	--	0
Columbia CO	332	1004.1	------	92	71	81.3	+.4	98	12	60	7	23	0	--	--	4.42	-.93	1.28	15	13	.0	0	6.3	---	80	N	13	10	14	7	5.0	63	0
Columbia	217	1008.1	1016.4	94	69	81.4	----	101	14	54	7	24	0	69	72	8.16	-----	1.90	16	16	.0	0	5.8	SW	--	---	--	11	15	5	4.7	--	0
Florence	146	1011.2	1016.6	92	69	80.5	----	100	13	57	7	20	0	70	75	10.79	-----	4.65	14	11	.0	0	6.2	SW	--	---	--	6	13	12	6.3	--	0
Greenville	1006	979.7	1016.2	90	69	79.9	+3.0	96	14	62	10	20	0	66	70	4.86	-.50	1.62	15	16	T	T	6.3	SW	60	N	15	6	19	6	5.5	76	0
Spartanburg	801	987.5	1016.9	91	69	79.7	-.3	98	13	58	7	21	0	67	70	1.65	-3.33	.79	9	17	.0	0	6.5	WSW	45	ESE	20	6	17	8	5.7	--	0
SOUTH DAKOTA																																	
Huron	1282	967.8	1014.1	82	60	71.1	-.7	98	26	50	4	7	0	61	74	1.42	-1.74	.84	9	10	.0	0	9.9	SSE	49	SE	5	9	11	11	5.4	66	17
Rapid City	3215	902.1	1014.3	84	58	70.8	-.2	104	19	47	13	13	0	56	67	1.63	-.45	.60	9	10	.0	0	9.5	SSE	36	NW	25	11	12	8	4.5	60	52
Sioux Falls	1420	964.8	1015.3	81	60	70.8	-2.6	95	20	48	13	4	0	61	75	2.73	-.42	.65	12	7	.0	0	8.6	S	*40	ESE	5	11	11	9	5.4	--	22
TENNESSEE																																	
Bristol	1519	964.1	1017.4	86	63	74.7	-1.7	93	22	52	7	7	0	66	78	7.89	+2.79	2.06	13	12	T	0	3.9	NE	--	---	--	6	15	10	5.9	--	0
Chattanooga	670	989.8	1016.6	91	68	79.8	+2.4	99	21	56	7	20	0	68	74	1.95	-2.30	.58	8	14	.0	0	3.9	SSW	30	S	27	11	14	6	5.0	68	0
Knoxville	949	982.4	1016.9	91	68	79.3	+2.6	98	22	58	7	20	0	67	73	4.06	-.30	1.23	11	11	.0	0	5.4	SW	57	SW	4	10	15	6	4.8	61	0
Memphis	263	1001.7	1015.9	92	72	81.8	+1.9	98	22	66	6	25	0	72	76	5.15	+2.15	1.76	10	8	.0	0	7.2	S	49	SE	23	9	13	9	5.8	73	0
Nashville	577	997.0	1016.5	90	70	79.7	+.6	97	22	59	7	17	0	69	74	3.79	-.09	2.29	12	10	.0	0	5.3	S	27	N	9	6	18	7	5.6	56	0
TEXAS																																	
Abilene	1752	952.9	1012.0	98	73	85.6	+4.5	104	20	64	2	31	0	63	54	1.47	-.65	1.46	2	5	.0	0	10.0	S	36	NE	27	14	14	3	3.6	88	0
Amarillo	3590	889.9	1011.5	94	69	81.1	+5.2	103	21	56	1	25	0	59	56	2.01	-.83	.80	7	11	T	T	12.7	S	37	SE	2	14	11	6	4.1	67	0
Austin	515	992.9	1014.0	98	76	86.8	+2.8	105	19	73	7	31	0	70	65	.19	-2.14	.17	2	2	.0	0	8.8	S	34	NE	27	12	16	3	4.1	85	0
Big Spring	2533	925.8	1012.3	97	73	85.1	+2.2	104	20	60	2	31	0	60	50	1.85	-.15	1.21	4	8	T	0	14.7	S	--	---	--	17	13	1	3.2	--	0
Brownsville	16	1011.2	1013.4	93	77	85.1	+1.5	96	19	72	17	31	0	74	78	.40	-1.87	.29	4	5	.0	0	12.9	SE	29	SE	2	12	15	4	4.3	81	0
Corpus Christi	40	1013.5	1014.2	95	77	85.7	+4.1	99	29	70	17	30	0	75	80	.22	-1.31	.13	3	4	.0	0	13.2	SSE	33	S	3	10	16	5	4.9	92	0
Dallas	487	996.3	1013.8	97	77	87.2	+3.0	103	20	68	1	30	0	69	61	.63	-2.23	.63	2	4	.0	0	10.7	SSE	30	S	3	18	10	3	3.2	87	0
Del Rio	957	979.3	1012.8	101	78	89.5	+3.2	107	19	74	18	31	0	65	52	T	-2.41	T	0	2	.0	0	11.4	SE	28	SE	28	14	17	0	3.4	83	0
El Paso	3920	880.5	1008.5	99	73	85.6	+5.9	107	8	64	23	30	0	52	38	2.48	+.49	1.47	7	10	.0	0	8.9	SSE	40	N	21	12	16	3	4.3	76	0
Fort Worth	688	990.2	1013.9	98	76	87.1	+3.5	104	20	68	2	30	0	66	58	2.22	-.39	1.87	3	3	.0	0	11.7	S	*40	NNW	1	20	9	2	3.0	--	0
Galveston CO	7	------	------	88	79	83.3	-.1	96	19	70	31	5	0	--	--	4.75	+1.04	2.50	7	--	.0	0	11.3	---	33	SE	14	--	--	--	---	76	0
Galveston	7	1014.9	1015.4	89	79	84.0	+.6	94	19	70	31	12	0	76	80	5.27	+1.56	2.93	12	15	.0	0	13.0	SSE	--	---	--	8	16	7	5.1	--	0
Houston CO	41	1010.2	------	94	77	85.5	+1.8	100	19	74	26	29	0	--	--	3.74	-.25	2.37	8	9	.0	0	8.8	---	29	SE	29	4	20	7	5.5	83	0
Houston	41	1012.5	1014.9	94	75	84.3	+1.8	100	19	72	5	29	0	73	77	1.06	-3.36	.37	8	11	.0	0	10.5	S	--	---	--	4	19	8	5.8	--	0
Laredo	500	997.0	1011.9	101	78	89.0	+1.7	104	19	73	18	31	0	70	62	.19	-1.49	.19	1	2	.0	0	16.3	SE	--	---	--	14	14	3	3.9	--	0
Lubbock	3238	903.2	1011.3	95	70	82.3	+3.2	103	8	58	1	27	0	59	53	2.04	-.09	1.43	4	6	.0	0	12.5	S	*38	SSE	23	15	12	4	4.0	--	0
Palestine CO	491	997.0	1014.6	96	74	85.0	+2.8	101	20	71	28	31	0	--	--	.75	-1.93	.46	3	4	.0	0	6.9	---	27	SE	25	9	19	3	4.6	87	0
Port Arthur CO	5	1013.5	------	91	78	84.6	+1.8	98	19	69	24	23	0	--	--	7.65	+.71	3.20	17	16	.0	0	10.5	---	36	N	24	10	14	7	5.3	60	0
Port Arthur	5	1014.2	1014.7	93	74	83.7	----	99	19	69	24	29	0	74	81	3.28	-----	1.20	15	15	.0	0	7.9	S	--	---	--	5	16	10	6.3	--	0
San Angelo	1903	946.8	1012.3	98	74	85.7	+2.1	105	19	65	2	31	0	61	52	.75	-1.26	.45	2	2	.0	0	10.5	SSE	--	---	--	15	15	1	3.5	--	0
San Antonio	782	989.5	1013.6	98	75	86.7	+2.9	105	19	71	17	31	0	68	63	.51	-1.66	.49	2	1	.0	0	9.2	SE	26	SE	11	10	18	3	4.4	84	0
Victoria	109	1009.8	1014.2	96	76	86.3	+3.0	102	29	72	14	31	0	74	76	.52	-3.20	.39	8	9	.0	0	8.7	SSE	*49	ESE	14	5	22	4	5.2	--	0
Waco	504	994.9	1013.1	99	77	88.1	+2.3	106	19	74	28	31	0	67	58	.33	-1.75	.32	3	1	.0	0	12.1	S	--	---	--	19	10	2	3.4	--	0
Wichita Falls	1027	977.0	1012.6	97	75	85.8	+.2	104	20	62	1	29	0	66	59	2.88	+.55	2.35	4	5	.0	0	11.3	SE	*31	ENE	4	21	8	2	2.6	--	0
UTAH																																	
Milford	5029	846.9	1012.2	94	57	75.4	+1.9	100	18	48	1	28	0	42	37	.76	-.14	.58	4	12	.0	0	8.6	S	--	---	--	18	9	4	3.2	--	0
Salt Lake City CO	4360	------	------	---	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	0
Salt Lake City	4222	866.6	1010.7	91	60	75.8	+1.8	101	15	49	12	19	0	47	42	2.17	+1.65	.93	6	7	.0	0	6.7	SSE	40	S	5	19	9	3	2.7	84	0
VERMONT																																	
Burlington	398	999.0	1012.0	80	60	70.0	-.3	89	26	53	7	0	0	60	72	4.46	+.96	1.43	14	7	.0	0	8.7	S	32	SW	4	4	13	14	6.6	51	6
VIRGINIA																																	
Cape Henry CO	16	1015.2	1015.9	85	71	78.1	+.6	96	23	63	8	5	0	--	--	2.38	-2.99	.81	9	8	.0	0	9.4	---	50	NW	5	16	9	6	4.2	80	0
Lynchburg	947	983.4	1016.7	88	66	76.8	+.7	96	23	58	6	12	0	65	71	2.58	-1.63	1.21	8	8	.0	0	6.9	SSW	38	NW	19	7	16	8	5.4	70	0
Norfolk CO	11	1013.2	------	88	72	79.6	+.9	95	23	64	7	9	0	--	--	2.78	-2.97	1.01	10	9	.0	0	8.0	---	30	NW	17	--	--	--	---	66	0
Norfolk	25	1015.2	1016.4	87	69	78.1	+.9	95	23	60	8	9	0	69	77	4.39	-1.36	1.93	9	8	.0	0	7.8	S	--	---	--	12	11	8	5.1	--	0
Richmond CO	162	------	------	89	69	78.8	+.3	98	23	59	6	16	0	--	--	3.69	-1.04	1.35	11	--	.0	0	----	---	--	---	--	--	--	--	---	--	0
Richmond	160	1010.2	1016.1	89	68	78.6	+.9	100	23	58	6	17	0	67	72	2.63	-----	.83	10	11	.0	0	5.8	S	41	NW	19	10	12	9	5.5	67	0
Roanoke	1192	975.3	1016.7	88	64	76.0	+.3	98	23	54	7	12	0	64	70	2.33	-1.85	1.17	14	7	.0	0	4.6	W	--	---	--	9	14	8	5.2	--	0
Washington CO	72	------	------	89	70	79.2	+2.4	96	22	60	6	12	0	--	--	2.50	-2.21	.90	8	8	.0	0	6.0	---	28	NW	5	--	--	--	---	75	0
Wash. Nat'l. AP	14	1011.9	1016.1	88	69	78.7	+1.9	95	22	61	6	11	0	66	69	5.25	+.54	2.90	10	8	.0	0	8.5	S	54	E	28	7	10	14	6.1	77	0
WASHINGTON																																	
Ellensburg	1727	952.6	1013.6	85	55	70.0	+1.8	97	23	41	5	12	0	46	46	.44	+.19	.42	2	3	.0	0	15.7	NW	--	---	--	25	5	1	1.6	--	27
Kelso	17	------	------	76	51	63.6	----	93	11	42	11	1	0	--	--	.14	-----	.12	2	0	.0	0	----	---	--	---	--	12	13	6	4.9	--	69
North Head CO	194	1010.2	1017.6	63	54	58.6	+1.4	91	11	51	12	1	0	--	--	.37	-.59	.24	9	0	.0	0	14.0	---	35	N	20	4	6	21	7.6	36	202
Olympia	190	1009.1	1016.7	78	49	63.7	----	94	11	42	7	2	0	51	70	.28	-----	.28	2	0	.0	0	4.1	SW	--	---	--	12	13	6	4.6	--	61
Port Angeles	11	1016.3	1017.5	63	51	56.8	----	79	11	47	5	0	0	51	83	.09	-----	.09	1	0	.0	0	14.8	WNW	--	---	--	12	12	7	4.6	--	247
Seattle	14	1015.6	1016.9	---	--	----	----	---	--	--	--	--	-	52	63	----	-----	----	--	0	--	-	8.2	NNW	--	---	--	--	--	--	---	--	---
Seattle CO	14	------	------	77	56	66.5	+1.0	96	12	52	4	2	0	--	--	.09	-.54	.07	2	0	.0	0	7.8	---	26	S	°3	13	12	6	4.2	72	25
Spokane	2357	945.1	1013.3	86	56	71.0	+2.0	98	17	45	7	12	0	44	41	.37	-.32	.14	5	3	.0	0	7.6	SW	36	SW	3	23	5	3	2.5	81	23
Stampede Pass CO	3960	881.1	1018.5	67	47	56.9	----	80	12	37	4	0	0	--	--	.56	-----	.54	2	0	.0	0	12.7	---	29	SW	°3	23	2	6	2.6	--	250
Stevenson CO	319	------	------	76	56	66.3	----	91	11	49	7	1	0	--	--	.51	-----	.40	3	0	.0	0	----	---	--	---	--	22	6	3	2.5	--	36
Tacoma CO	127	1009.8	1016.6	75	55	65.0	+2.2	95	12	51	7	1	0	--	--	.21	-.39	.21	2	1	.0	0	6.1	---	24	N	10	12	14	5	4.1	68	38
Tatoosh CO	101	1014.9	1018.1	59	52	55.5	+.4	70	12	48	5	0	0	53	92	.37	-1.17	.16	10	0	.0	0	10.1	SW	37	S	12	1	6	24	8.3	32	286
Walla Walla	1200	------	------	---	--	----	----	---	--	--	--	--	-	47	--	----	-----	----	--	--	--	-	8.2	S	--	---	--	--	--	--	---	--	---
Walla Walla CO	949	977.3	1012.5	90	63	76.8	+2.8	102	23	52	10	20	0	--	--	.13	-.26	.10	4	2	.0	0	5.5	---	23	NE	9	24	6	1	1.7	90	1
Yakima	1061	974.3	1012.5	90	52	71.1	-.3	100	17	43	7	19	0	46	45	.13	-.15	.12	2	3	.0	0	7.2	W	--	---	--	26	4	1	1.3	--	15
Seattle-Tacoma AP	379	1002.7	1017.0	76	52	64.4	----	96	12	47	5	2	0	51	64	.31	-----	.31	2	1	.0	0	9.2	SW	--	---	--	13	14	4	4.1	--	53
WEST VIRGINIA																																	
Charleston	950	981.7	1016.7	88	64	75.8	----	97	23	52	21	14	0	65	73	3.19	-----	2.11	8	5	T	0	5.9	S	*28	WSW	4	7	13	11	5.9	--	0
Elkins	1969	949.2	1017.2	83	57	70.0	+.2	90	27	41	6	2	0	62	81	3.50	-1.88	.88	12	10	T	T	3.3	WNW	72	NW	5	2	14	15	7.0	60	14
Huntington	565	------	------	89	64	76.7	+1.4	98	23	54	°6	16	0	--	--	1.85	-2.63	.56	11	--	.0	0	----	---	--	---	--	--	--	--	---	--	0
Parkersburg CO	615	------	------	87	64	75.4	0.0	95	22	55	7	8	0	--	--	1.88	-2.41	.93	6	7	.0	0	4.9	---	21	NW	5	8	12	11	5.8	75	0
Parkersburg	837	------	1016.3	---	--	----	----	---	--	--	--	--	-	64	--	----	-----	----	--	--	--	-	5.7	SSW	--	---	--	--	--	--	---	--	---
Petersburg	1013	980.0	------	88	61	74.6	----	98	22	46	6	16	0	--	--	.95	-----	.17	9	6	.0	0	----	---	--	---	--	6	13	12	6.2	--	4
WISCONSIN																																	
Green Bay	689	989.5	1015.2	79	57	67.6	-2.4	88	26	44	5	0	0	59	76	4.12	+.66	1.68	9	6	.0	0	10.9	SW	50	N	7	11	10	10	5.2	64	30
La Crosse CO	----	------	------	---	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	5
La Crosse	669	990.5	1014.9	82	62	72.2	+.4	91	26	49	5	3	0	61	73	5.94	+2.04	2.75	11	8	T	T	8.1	S	*36	N	16	10	13	8	5.5	--	3
Madison CO	----	------	------	---	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	6
Madison	857	984.8	1016.0	83	59	70.8	-1.3	94	24	45	5	4	0	61	73	3.08	-.80	1.40	6	5	.0	0	8.1	W	72	NW	8	13	7	11	5.1	72	13
Milwaukee CO	----	------	------	---	--	----	----	---	--	--	--	--	-	--	--	----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	11
Milwaukee	674	990.5	1015.4	79	60	69.9	+1.7	90	26	51	6	1	0	60	73	3.12	+.29	1.56	7	5	.0	0	9.4	SW	38	SW	8	13	5	13	5.5	65	11

See footnotes at end of table.

CLIMATOLOGICAL DATA

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover , tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
WYOMING																																	
Casper	5322	839.1	1012.1	85	55	69.9	-2.2	97	19	43	11	14	0	44	48	3.05	+1.85	1.33	10	10	T	T	8.2	SW	--	---	--	18	8	5	3.5	--	47
Cheyenne	6139	815.1	1014.2	81	53	66.8	+.1	92	7	44	1	3	0	49	59	2.74	+.64	1.15	15	14	1.0	T	9.9	SSE	27	SE	4	12	9	10	4.7	62	65
Lander	5563	837.5	1014.2	85	53	69.0	+1.6	97	19	40	11	13	0	43	45	.88	+.19	.44	5	6	.0	0	7.1	---	40	SW	7	17	5	9	3.8	75	51
Rock Springs	6741	797.8	1015.3	83	53	67.9	-.3	93	19	39	12	3	0	38	40	.32	-.42	.12	4	6	.0	0	10.4	WSW	*37	W	°2	15	10	6	4.0	--	35
Sheridan	3942	885.2	1013.6	86	54	69.9	+1.5	99	14	43	12	17	0	50	56	1.97	+.75	1.39	10	8	.0	0	7.7	S	56	NW	25	17	8	6	3.9	76	60
PACIFIC AREA																																	
Canton Island	9	1008.8	1009.2	92	79	85.2	----	96	28	75	11	23	0	75	78	2.35	-----	.72	16	1	.0	0	----	---	--	---	--	0	26	5	6.2	--	0
Hilo	28	1014.9	1016.5	83	69	75.8	----	86	1	65	16	0	0	68	80	11.97	-----	5.42	28	0	.0	0	5.3	SW	23	ESE	30	1	16	14	7.2	34	0
Honolulu CO	12	------	------	83	74	78.4	+.7	84	12	70	2	0	0	--	--	.73	-.46	.24	15	--	.0	0	----	---	--	---	--	--	--	--	---	--	0
Honolulu	7	1015.6	1016.4	85	74	79.6	----	87	23	70	1	0	0	67	67	.24	-----	.08	9	0	.0	0	13.6	ENE	30	NE	°13	12	17	2	4.3	70	0
Lihue	115	1011.9	1017.0	84	73	78.7	----	86	1	68	1	0	0	70	76	1.19	-----	.20	17	0	.0	0	11.1	NE	29	E	°13	2	25	4	5.9	61	0
Wake Island	9	1013.9	1014.3	88	78	82.6	----	89	23	73	5	0	0	75	77	1.30	-----	.26	16	1	.0	0	12.7	ENE	--	---	--	13	12	6	4.7	--	0
Yap Island	51	1008.1	1009.9	88	76	81.7	----	93	1	73	5	7	0	--	--	10.85	-----	1.98	28	0	.0	0	----	---	--	---	--	--	--	--	---	--	0
PUERTO RICO																																	
San Juan CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	-----	-----	----	--	--	--	-	----	---	--	---	--	--	--	--	---	--	0
San Juan	9	1014.2	1016.4	87	75	80.7	----	90	7	72	6	2	0	74	81	8.51	-----	1.52	27	16	.0	0	11.7	ESE	40	E	29	3	12	16	7.0	53	0
ALASKA																																	
Anchorage	134	1011.9	1016.6	69	50	59.7	+2.7	82	10	39	31	12	0	52	77	1.83	+.20	.67	10	0	.0	0	5.5	NW	31	S	6	7	13	11	6.0	50	170
Annette Island	110	1013.3	1017.3	65	52	58.1	+.7	79	1	46	4	5	0	53	84	2.68	-3.46	.95	12	0	.0	0	7.8	SE	*28	SE	6	6	4	21	7.5	--	211
Barrow	22	1011.2	1011.5	50	38	44.0	+4.2	72	15	29	2	1	7	42	92	1.60	+.75	.60	15	0	.0	0	12.3	SW	31	E	14	1	3	27	9.1	--	642
Bethel	21	1014.6	1015.9	60	48	53.8	-.7	86	12	41	30	3	0	49	84	2.65	+.36	.90	17	0	.0	0	10.4	S	*28	SSE	15	0	5	26	9.4	--	361
Cordova	40	1014.2	1016.3	64	48	55.8	+2.9	81	3	39	1	5	0	51	85	3.47	-1.64	.96	17	0	.0	0	2.3	SW	*15	SW	°1	2	3	26	8.7	--	279
Fairbanks	436	998.0	1015.2	71	49	60.3	+.4	90	16	38	31	15	0	48	69	1.77	-.13	.54	15	1	.0	0	6.2	SW	50	SW	16	6	7	18	7.1	28	153
Galena	120	1009.5	1014.2	65	49	57.2	-3.8	84	14	40	22	7	0	48	71	2.40	-.04	.84	14	0	.0	0	10.3	SSW	*38	SW	5	2	6	23	8.2	--	239
Gambell	25	1009.8	1010.8	47	41	44.4	-.7	52	°30	37	26	0	0	42	91	1.46	-.23	.28	12	0	.0	0	14.8	SSW	31	NE	13	0	5	26	9.1	--	631
Juneau	15	1015.1	1016.0	72	49	60.3	+4.8	83	°4	42	3	18	0	49	70	2.67	-1.55	1.25	8	0	.0	0	5.2	N	22	SE	21	8	10	13	6.2	55	146
Kotzebue	10	1011.2	1011.9	56	47	51.6	-1.6	70	15	40	21	1	0	47	84	2.45	+1.01	.64	20	0	.0	0	16.5	W	--	---	--	4	1	26	8.4	--	412
McGrath	334	1003.1	1015.6	67	49	58.3	-.5	85	13	39	17	9	0	49	73	1.27	-1.15	.53	12	0	.0	0	5.6	S	*27	SSW	5	3	6	22	8.0	--	220
Nome	13	1012.5	1013.2	54	44	49.0	-.9	74	12	35	28	1	0	46	89	4.15	+1.65	.87	16	0	.0	0	10.8	S	34	SW	7	3	7	21	8.1	39	489
Northway	1713	952.3	1014.9	74	50	61.9	+3.0	87	8	44	7	21	0	48	64	1.78	-1.36	1.20	8	0	.0	0	4.5	NW	--	---	--	3	9	19	7.5	--	114
St. Paul Island	22	1013.7	1014.9	50	43	46.9	+1.2	56	31	39	19	0	0	45	93	2.68	+.01	†1.08	17	0	.0	0	----	---	--	---	--	0	0	31	9.9	--	553
Umiat	337	1002.2	1014.9	65	45	54.6	+1.6	85	15	33	2	8	0	45	73	1.68	+1.15	.52	12	1	.0	0	7.5	W	*25	WSW	°6	1	8	22	9.0	--	326
Wales	9	1009.5	1010.2	48	41	44.9	-1.3	58	14	37	21	0	0	42	91	.87	-.46	.42	9	0	.0	0	----	---	--	---	--	0	7	24	8.9	--	1519
Yakutat	28	1015.9	1017.1	62	48	55.1	+1.8	79	4	41	3	3	0	52	89	5.94	-2.27	2.49	10	0	.0	0	6.1	W	*24	ESE	21	5	11	17	7.5	--	301

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
° Other dates also.
**Peak gust data.
† Calendar day.

DEGREE DAYS

Table 3

(Base 65°F.)

JULY 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	0	0	0
Mobile (CO)	0	0	0
Mobile	0	0	
Montgomery (CO)	0	0	0
Montgomery	0	0	0
ARIZONA			
Flagstaff	4	4	42
Payson (CO)	0	0	
Phoenix (CO)	0	0	0
Phoenix	0	0	
Prescott	0	0	
Tucson	0	0	
Winslow	0	0	
Yuma	0	0	0
ARKANSAS			
Ft. Smith	0	0	0
Little Rock	0	0	0
Texarkana	0	0	
CALIFORNIA			
Bakersfield	0	0	0
Beaumont (CO)	0	0	
Bishop	0	0	0
Blue Canyon	33	33	
Burbank	0	0	
Eureka (CO)	279	279	281
Fresno	0	0	0
Los Angeles (CO)	0	0	1
Los Angeles	3	3	
Mt. Shasta (CO)	24	24	
Oakland	113	113	72
Red Bluff	0	0	0
Sacramento (CO)	2	2	2
Sacramento	1	1	
Sandberg (CO)	1	1	
San Diego	0	0	6
San Francisco (CO)	266	266	199
San Francisco	189	189	130
San Jose	22	22	
Santa Catalina	61	61	
Santa Maria	118	118	
COLORADO			
Alamosa	10	10	
Colorado Springs	16	16	
Denver	17	17	8
Grand Junction	0	0	1
Pueblo	0	0	2
CONNECTICUT			
Bridgeport	0	0	
Hartford	0	0	3
New Haven	0	0	3
DELAWARE			
Wilmington	0	0	
DIST. OF COLUMBIA			
Washington (CO)	0	0	0
Washington	0	0	
FLORIDA			
Apalachicola	0	0	0
Daytona Beach	0	0	
Fort Myers	0	0	0
Jacksonville (CO)	0	0	0
Jacksonville	0	0	
Key West (CO)	0	0	0
Key West	0	0	
Melbourne	0	0	
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	
Miami Beach	0	0	
Orlando	0	0	
Pensacola (CO)	0	0	0
Tallahassee	0	0	
Tampa	0	0	0
West Palm Beach	0	0	
GEORGIA			
Albany	0	0	0
Atlanta (CO)	0	0	0
Atlanta	0	0	
Athens	0	0	
Augusta	0	0	0
Columbus	0	0	
Macon	0	0	0
Rome	0	0	
Savannah	0	0	0
Valdosta	0	0	
IDAHO			
Boise	1	1	9
Lewiston	10	10	
Pocatello	12	12	12
ILLINOIS			
Cairo (CO)	0	0	0
Chicago (CO)	0	0	6
Chicago	0	0	
Chicago University	5	5	
Joliet	3	3	
Moline	3	3	
Peoria	1	1	2
Springfield (CO)	0	0	0
Springfield	0	0	
INDIANA			
Evansville	1	1	0
Ft. Wayne	0	0	5
Indianapolis (CO)	0	0	1
Indianapolis	0	0	
South Bend	2	2	
Terre Haute	0	0	

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
IOWA			
Burlington	1	1	1
Charles City (CO)	14	14	6
Davenport	0	0	2
Des Moines	3	3	2
Dubuque	17	17	3
Keokuk (CO)	2	2	1
Sioux City	17	17	4
KANSAS			
Concordia (CO)	0	0	1
Dodge City	0	0	1
Goodland	24	24	2
Topeka (CO)	0	0	0
Topeka	0	0	
Wichita	0	0	0
KENTUCKY			
Lexington	0	0	1
Louisville (CO)	0	0	0
Louisville	0	0	
Pikeville (CO)	0	0	
LOUISIANA			
Baton Rouge	0	0	0
Lake Charles	0	0	
New Orleans (CO)	0	0	0
New Orleans	0	0	
Int.Airport,Moisant	0	0	
Shreveport	0	0	0
MAINE			
Caribou	77	77	
Eastport	77	77	154
Greenville (CO)	70	70	69
Portland	10	10	28
MARYLAND			
Baltimore (CO)	0	0	0
Baltimore	0	0	
Frederick	0	0	
MASSACHUSETTS			
Boston	0	0	7
Milton	4	4	
Nantucket	0	0	15
Pittsfield	21	21	
MICHIGAN			
Alpena (CO)	44	44	51
Detroit	1	1	7
Escanaba (CO)	48	48	56
Grand Rapids (CO)	0	0	8
Grand Rapids	8	8	
Lansing	5	5	10
Marquette (CO)	80	80	84
Muskegon	14	14	
Sault Ste. Marie	120	120	90
Ypsilanti	1	1	
MINNESOTA			
Duluth (CO)	93	93	74
Duluth	88	88	
International Falls	81	81	
Minneapolis	5	5	8
Rochester	12	12	
St. Cloud	16	16	23
St. Paul	1	1	9
MISSISSIPPI			
Jackson	0	0	0
Meridian	0	0	0
Vicksburg	0	0	0
MISSOURI			
Columbia	4	4	1
Kansas City	1	1	0
St. Joseph	2	2	0
St. Louis (CO)	0	0	0
St. Louis	1	1	
Springfield	0	0	1
MONTANA			
Billings	54	54	
Butte	133	133	
Glasgow (CO)	26	26	
Great Falls	61	61	
Havre (CO)	28	28	26
Helena	56	56	43
Kalispell	77	77	66
Missoula	67	67	38
Miles City	45	45	
NEBRASKA			
Grand Island	19	19	
Lincoln (CO)	3	3	1
Lincoln	7	7	
Norfolk	21	21	
North Platte	37	37	4
Omaha	5	5	1
Valentine (CO)	53	53	9
Scottsbluff	27	27	
NEVADA			
Elko	21	21	
Ely	4	4	
Las Vegas	0	0	
Reno	15	15	9
Tonopah	0	0	
Winnemucca	5	5	11
NEW HAMPSHIRE			
Concord	9	9	19
Mt. Washington	504	504	
NEW JERSEY			
Atlantic City	0	0	1
Newark	0	0	1
Trenton	0	0	1

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
NEW MEXICO			
Albuquerque	0	0	0
Clayton	0	0	0
Roswell	0	0	0
Raton	3	3	
NEW YORK			
Albany	1	1	4
Bear Mountain (CO)	5	5	
Binghamton	20	20	16
Buffalo	6	6	15
New York (CO)	0	0	1
La Guardia Field	0	0	
Oswego	3	3	20
Rochester	7	7	10
Schenectady (CO)	0	0	
Syracuse	3	3	13
NORTH CAROLINA			
Asheville (CO)	0	0	2
Asheville	0	0	
Charlotte	0	0	0
Greensboro	0	0	0
Hatteras	0	0	0
Raleigh (CO)	0	0	0
Raleigh	0	0	
Wilmington (CO)	0	0	0
Winston-Salem	0	0	
NORTH DAKOTA			
Bismarck	33	33	20
Devils Lake (CO)	46	46	41
Fargo	35	35	20
Grand Forks	35	35	32
Pembina	43	43	
Williston (CO)	38	38	27
OHIO			
Akron	9	9	8
Cincinnati (CO)	0	0	1
Cincinnati	0	0	
Cleveland (CO)	1	1	7
Cleveland	0	0	
Columbus	0	0	2
Dayton	0	0	2
Sandusky (CO)	0	0	3
Toledo	0	0	6
Youngstown	7	7	
OKLAHOMA			
Oklahoma City (CO)	3	3	0
Oklahoma City	2	2	
Tulsa	0	0	
OREGON			
Baker (CO)	35	35	54
Baker	41	41	
Burns (CO)	15	15	
Eugene	14	14	
Meacham	79	79	
Medford	7	7	7
Pendleton	8	8	
Portland (CO)	16	16	27
Portland	15	15	
Roseburg (CO)	10	10	23
Salem	20	20	
Sexton Summit (CO)	69	69	
Troutdale	30	30	
PENNSYLVANIA			
Allentown	0	0	
Curwensville	38	38	
Erie (CO)	0	0	8
Harrisburg	0	0	1
Park Place	14	14	
Philadelphia (CO)	0	0	0
Philadelphia	0	0	
Pittsburgh (CO)	1	1	2
Pittsburgh	3	3	5
Reading (CO)	0	0	1
Scranton (CO)	1	1	6
Williamsport	0	0	5
RHODE ISLAND			
Block Island	0	0	9
Providence (CO)	0	0	5
Providence	0	0	
SOUTH CAROLINA			
Charleston (CO)	0	0	0
Charleston	0	0	
Columbia (CO)	0	0	0
Columbia	0	0	
Florence	0	0	
Greenville	0	0	0
Spartanburg	0	0	
SOUTH DAKOTA			
Huron	17	17	10
Pierre	27	27	4
Rapid City	52	52	15
Sioux Falls	22	22	
TENNESSEE			
Bristol	0	0	
Chattanooga (CO)	0	0	
Chattanooga	0	0	0
Knoxville	0	0	0
Memphis	0	0	0
Nashville	0	0	0
TEXAS			
Abilene	0	0	0
Amarillo	0	0	1
Austin	0	0	0
Big Spring	0	0	0
Brownsville	0	0	0

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
TEXAS (Cont'd.)			
Corpus Christi	0	0	0
Dallas	0	0	0
Del Rio (CO)	0	0	0
El Paso	0	0	0
Ft. Worth	0	0	0
Galveston (CO)	0	0	0
Galveston	0	0	
Houston (CO)	0	0	
Houston	0	0	0
Laredo	0	0	
Lubbock	0	0	
Palestine (CO)	0	0	0
Port Arthur (CO)	0	0	0
Port Arthur	0	0	
San Angelo	0	0	
San Antonio	0	0	0
Victoria	0	0	
Wichita Falls	0	0	
Waco	0	0	
UTAH			
Milford	0	0	
Salt Lake City (CO)	0	0	3
Salt Lake City	0	0	0
VERMONT			
Burlington	6	6	20
VIRGINIA			
Cape Henry	0	0	0
Lynchburg	0	0	0
Norfolk (CO)	0	0	0
Norfolk	0	0	
Richmond (CO)	0	0	0
Richmond	0	0	
Roanoke	0	0	1
WASHINGTON			
Ellensburg	27	27	
Kelso	69	69	
North Head (CO)	202	202	226
Olympia	61	61	
Port Angeles	247	247	
Seattle (CO)	25	25	45
Seattle	17	17	
Spokane	23	23	21
Stampede Pass (CO)	250	250	
Stevenson (CO)	36	36	
Tacoma (CO)	38	38	71
Tatoosh Island	286	286	300
Walla Walla (CO)	1	1	5
Yakima	15	15	9
WEST VIRGINIA			
Charleston	0	0	
Elkins	14	14	15
Huntington	0	0	
Parkersburg (CO)	0	0	1
Petersburg	4	4	
WISCONSIN			
Green Bay	30	30	17
La Crosse (CO)	5	5	7
La Crosse	3	3	
Madison (CO)	6	6	8
Madison	13	13	
Milwaukee (CO)	11	11	15
Milwaukee	11	11	
WYOMING			
Casper	47	47	
Cheyenne	65	65	35
Lander	51	51	28
Rock Springs (CO)	19	19	
Rock Springs	35	35	
Sheridan	60	60	
ALASKA			
Anchorage	170	170	
Annette Island	211	211	
Barrow	642	642	790
Bethel	361	361	325
Cordova	279	279	
Fairbanks	153	153	168
Galena	239	239	
Gambell	631	631	
Juneau	146	146	
Kotzebue	412	412	
McGrath	220	220	
Nome	489	489	470
Northway	114	114	
St. Paul	553	553	
Yakutat	301	301	
Umiat	1702	1702	
Wales	1519	1519	

Data from airport unless otherwise specified. CO indicates data from city office.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Harrington (near), Lincoln County, Wash.	1	2:30–3:30 p.m.					See remarks	See remarks	Thunderstorm and rain	A local thunderstorm with heavy rainfall caused moderate, unestimated damage to highways and barley crops in area extending from 2 miles south to 4 miles east of town of Harrington. Highway damage limited to grade washouts. One bunkhouse washed from its foundations. Some barley beaten down.
Cheyenne, Wyo.	1	8 p.m.					Light	Light	Hail	Principal damage to trees and shrubs.
Plattsmouth, Nebr.	1	Night					$1,000		Electrical	Struck schoolhouse.
Olton, Lamb County, Tex.	2	12:15 a.m.			0	0	See remarks	See remarks	Tornado and hail	Grain elevator demolished. Some homes unroofed. Light to heavy hail damage. About 500 acres of cotton completely destroyed.
Blair (south and west of), Nebr.	2	7–7:45 p.m.	*2	10			Slight	Considerable	Hail	
Rooks County, Kans.	2	Night					500		Wind	Strong wind with local tornadic characteristics in southern Rooks County partly unroofed large barn, uprooted trees, and loosened roof on pump house on farm 10 miles southwest of Plainville.
Mitchell County, Kans.	2	Night					3,500		Electrical	Home in Cawker City struck by lightning and burned to ground, but most of contents saved.
Sioux County, Iowa	2–3	11 p.m.–4 a.m.					See remarks	See remarks	Hail	Estimated 100 to 150 farms almost 100 percent crop damage. Trees uprooted, with several roofs of homes and buildings damaged by falling limbs.
Cazenovia, Richland County, Wis.	3	8 p.m.	50	½	0	0	10,000	$ 0	Tornado	Farm barn totally demolished; wreckage scattered over large area.
Webb City, Mo.	4	1:30 a.m.	100	**200	0	1	30,000	0	Tornado and rain	Accompanied by heavy rain, tornado moved eastward through West End business and residential section. Some buildings in path were skipped. Roofs blown off 6 business places and several homes.
Middleton, Canyon County, Idaho	4	2 a.m.					See remarks		Electrical and wind	Barn on ranch struck and completely destroyed by fire. High wind fanned flames. In addition to barn, 600 lbs. of grain, a large supply of shingles, and a milking machine destroyed.
Denton, Mont.	4	1:30 p.m.	*3	20				250,000	Hail	Hailstones size of golf balls.
Carter, Mont.	4	1:30 p.m.	*2–3	20				Severe	do	Fifteen hundred acres of 30 bushel per acre wheat damaged.
Power, Mont.	4	3:30 p.m.	*3	10–11				Severe	do	Damage to winter and spring wheat. Hailstones up to 1 inch.
Fargo (near), Ellis County, Okla.	4	Afternoon			1	1			Electrical	One woman killed and another injured.
Maryville (5 to 8 miles south of), Tenn.	4	4 p.m.	1,320	2			43,000	7,000	Thunderstorm and winds	Trees uprooted. Barns and sheds blown down or extensively damaged. Many houses unroofed or slightly damaged. Power and telephone lines blown down.
Forsyth, Mont.	4	6 p.m.	*3	6			Slight	15,000	Hail	Hailstones up to 1½ inches. Wheat, sugarbeets, corn, and gardens damaged. Some damage to composition roofs in Forsyth.
Kansas, southwestern portion	4	6–11 p.m.		100	0	0	7,500	1,000	Tornado, wind, and hail	Severe wind, beginning in Grant and Stevens Counties at 6 p.m., and extending into Ford County by 11 p.m., damaged roofs, sheds, and trees, blew over radio towers 10 miles south of Ulysses, and toppled box cars near Sublette. Hail occurred at Ulysses and north of Liberal. A funnel cloud sighted for about 20 minutes east of Ulysses, and damage northeast of Bucklin in Ford County indicated possibility that a small tornado struck there. Property damage by wind, $5,000; by tornado, $2,500.
Barbourville, Ky.	4	P.m.			1	2			Electrical	Death and injuries were result of being struck by lightning when seeking refuge under a tree.
Havre de Grace, Md.	4	8:30 p.m.				1	See remarks		Thunderstorm and wind	Trees felled, and power poles and lines knocked down by the hundreds. Thirty-five trees removed from main streets alone, while dozens of others fell on lawns and side streets. Roof of Elks Home blown off in one piece and landed across street on a private home. Falling power lines started fires in five homes, but little damage done.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Oklahoma City, Okla.	4	Night					$5,000		Electrical	Damage to administration building tower and roof.
Chinook, Mont.	4		880	2				$5,000	Hail	In Clear Creek area 25 miles southwest of Chinook.
Maljamar, N. Mex.	4						See remarks		Wind and rain	Damage to buildings.
Cheyenne County, Kans.	5	12:30 a.m.					10,000		Electrical	New school house 17 miles northeast of St. Francis destroyed by fire after being struck by lightning.
Wilkes County, N. C.	5	3 p.m.						6,000	Hail	Area of damage 6 square miles.
Alamance County, N. C.	5	4-5 p.m.						10,000	do	Area of damage 6 square miles.
Cottonwood (near), Idaho	5	4:30 p.m.	•3	6				See remarks	do	Hailstones averaging 3/4 inch, with largest 1-1/4 inches, caused estimated loss of 10 to 30 percent of wheat crop and 20 to 60 percent of pea crop in 3 by 6 mile area. Storm began about 2 miles south of Cottonwood and traveled northeastward.
Choteau, Mont.	5	6 p.m.	•5-6	15				Severe	do	Storm between Choteau and Dutton. Damage to small grains.
Augusta, Mont.	5		•15	25			30,000	350,000	do	Hailstones up to 1½ inches.
Malta, Mont.	5-6	Midnight	•1-3	3-5				50,000	do	Damage to wheat. Three separate storms, two north and one south of Cottonwood Creek.
Auburn (near), Nebr.	6	Early morning					5,000	5,000	Rain and flash flood	Previous wet season had prevented planting crops in bottoms, or crop damage would have been much greater.
Longbeach, Brunswick County, N.C.	6						7,000		Waterspout	One house practically destroyed.
Plevna, Mont.	6							Slight	Hail	Damage to wheat 5 to 10 percent.
Madrid (near), Nebr.	7	4-5 p.m.	•1	5	0	0	2,000	6,000	Tornado	Small tornado.
Decatur County, Kans.	7	Afternoon					600		Electrical	Lightning struck and killed a team of work horses and 2 saddle horses in pasture near Jennings.
Graham (southern portion), Ellis and Rooks Counties, Kans.	7	6 p.m.			0	0	2,000		Tornado and wind	Severe winds swept across southern part of Graham and Rooks Counties and as far south as Ellis in Ellis County. Tornado hit Palco in southwestern Rooks County, tearing roof from house and disrupting telephone and power lines. Elsewhere wind blew limbs from trees, and at Plainville damaged a farm home and destroyed grain bin. Property damage by wind, $1,000; by tornado, $1,000.
Ogilvie (vicinity of), Minn.	7	P.m.					600		Electrical	Two milk cows killed and 10 other cows knocked down inside barn struck by lightning.
Minnesota, central and southeastern counties	7-8	P.m.-a.m.		200			200,000	See remarks	Thundersqualls, with tornadic wind, rain, and hail	Many barns, outbuildings, silos, and windmills demolished. Town buildings, houses, and barns damaged. An airplane on ground wrecked and two hangars and a number of airplanes within, damaged at St. Cloud Airport. Power and communication lines downed. Hundreds of trees uprooted. Some livestock and much poultry crops perished. Growing crops damaged considerably. Storm in central counties moved from northwest, but in extreme southeastern counties from southwest. Greatest destruction in extreme southeastern counties where storm assumed tornadic proportions. Heavy rains and hail accompanied storm.
Wisconsin, entire state	7-8	P.m. 7th-a.m. 8th					2,000,000	500,000	Winds, rain, and electrical	Squall line with very severe thunderstorms moved eastward across State, accompanied by high winds, heavy rain, and lightning. Madison reported gusts up to 88 m.p.h. At least 150 farm barns demolished or badly damaged, including over 75 barns in Rusk County alone. Other buildings in State damaged by lightning-started fires. High winds uprooted thousands of large trees over State, including about 500 trees in Milwaukee. An estimated five million board feet of timber downed in Flambeau National Forest in northern Wisconsin. Telephone and electric services badly disrupted by falling trees and lightning. About 300 long distance lines out of order. High winds capsized many small pleasure boats at Milwaukee, and Madison. Heavy rain and scattered hail flattened crops, although many fields recovered.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										Excessively heavy rain caused considerable damage in hill country of southwest. At least 15 bridges or their approaches washed out by flash floods on small streams in Trempealeau, La Crosse, and other counties in that section. Darlington flooded by quick rise on Pecatonica River.
Manchester, Iowa	8	2 a.m.					See remarks	See remarks	Wind and rain	Rain continued for 15 hours. Maquoketa River and small creeks overflowed, flooding parts of town. Twenty families evacuated. Rain quit, water receded rapidly. Bus overturned with 35 persons, due to water over highway. No injuries.
Rudyard, Mich.	8	3 to 8 a.m.	*8	8			$6,000		Wind	
Emmet County, Iowa	8	4 a.m.					See remarks	See remarks	Wind, hail, and rain	Covered most of County. Crops 25 to 50 percent damaged. Hail size of marbles, occasionally golf ball size. Storm moved southeastward.
Clinton, Iowa	8	4 a.m.					See remarks	See remarks	Wind and rain	Three distinct storms at 4 a.m., 9:30 a.m. and 6:54 p.m. Total rain 3.24 inches. No hail damage to crops; however, considerable wind and rain damage.
Algona, Iowa	8	5 a.m.				1	200,000	See remarks	Wind, hail, and rain	Wind estimated near 100 m.p.h. Storm moved south-southeastward. Miscellaneous damage in whole city of Algona. Approximately 25 farm buildings damaged or demolished northwest and southeast of Algona.
Escanaba, Mich.	8	5 a.m.					20,000		Wind	Winds, reaching speeds of 42 m.p.h., overturned and sank a 25-foot sailboat; 2 others driven ashore. Utility lines and other property damaged by winds. Wind blew down four barns.
Dubuque, Iowa	8	8 a.m.			1		See remarks	See remarks	Wind and rain	Wind 100 m.p.h. Rain throughout day over 5 inches. Creeks and small rivers overflowed. Numerous bridges and approaches washed out. Man drowned as his car swept into creek east of Independence. Numerous trees blown down; 28 power breaks, minor damage to homes; highway north of Dubuque closed temporarily by high water and fallen trees.
Lyon County, Kans.	8	8 a.m.	*20	40			75,000	$30,000	Wind	Heavy wind over much of Lyon County caused considerable damage to small buildings, power and telephone lines, store windows, and trees, as well as to ripened grains in fields. Emporia suffered quite heavily in storm.
Hancock County, Iowa	8	A.m.					See remarks	See remarks	Electrical, wind and rain	Two barns struck by lightning and burned near Britt.
New Orleans, La.	8–17	Afternoons			1				Heat wave	Seaman died from heat exhaustion.
New Orleans, La.	8–19	Afternoons			1				do	Woman died from heat exhaustion.
Lower Michigan	8				4		10,000		Wind	Three persons drowned in Crystal Lake when high winds capsized their boat. Another death resulted when car swerved to avoid falling tree. Tents of vacationers at Holland and Grand Haven blown down.
Camden area, Ray County, Mo.	8	7:45–8:30 p.m.	100	6	0	0	20,000	500	Tornado	Traveling northeastward and then eastward, tornado hit three hilltop farms, killing livestock and ruining two homes, five barns, a garage, two autos, and several pieces of farm equipment.
St. Joseph County, Ind.	8–9	P.m. of 8th–a.m. of 9th					10,000	500	Wind, rain, and electrical	Trees downed. House struck by lightning. Basements flooded by heavy rain.
Illinois, northeastern portion	8–9						208,500	2,518,760	Rain, wind, and hail	Heavy rains and locally severe thunderstorms caused widespread flooding over areas north of Danville, Lincoln, Peoria, and Rock Island sections. Local hail reported, in addition to high winds. Damage estimates include all these factors since it is not feasible to differentiate.
Kokomo, Ind.	9	1 a.m.	*1		0	0	100,000	2,000	Tornado	Storm appeared to have tornadic characteristics. Path southeastward. Bottling works and a super market destroyed. Many trees blown down. Roofs damaged. Oats and standing grain blown down, etc.
Coffey County, Kans.	9	Early a.m.					5,000		Electrical	Large barn east of Agricola burned to ground after being struck by lightning.
Franklin County, Kans.	9	Early a.m.					1,500		do	Two 500-barrel oil tanks near Ottawa burned after being struck by lightning.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Shreveport, La.	9-25	Late afternoons					$4,300		Electrical	Two homes struck by lightning; one destroyed, other damaged badly.
Bourbon County, Kans.	9	5 p.m.					4,000		do	Large barn 6 miles northwest of Ft. Scott struck by lightning and burned to ground.
Pauline (near), Nebr.	9	8-8:30 p.m.	*1	3-4			1,000	$20,000	Hail	
Logan County, Nebr.	9-10	Night	*2	15			4,000	25,000	do	
Linn County, Kans.	9	Night					500		Electrical	Two milk cows and calf killed northeast of Linn by lightning strike.
Gosper County (northern portion), Nebr.	9	10:30-11 p.m.	*2--5	20			Slight	Considerable	Hail	Crop damage heavy, but not estimated.
West Plains (15 miles southeast of), Mo.	9	11:30-12 p.m.	300	2	0	0		Unknown	Tornado and hail	A small tornado ripped down timber and uprooted brush, apparently not affecting buildings or livestock. Hail averaging ½ inch in diameter beat down and stripped corn and other crops.
Neosho County, Kans.	9						4,500		Electrical	Barn and contents of hay and feed near St. Paul destroyed by fire resulting from lightning.
Geary County, Kans.	10	12:45 a.m.					3,500		Wind and rain	Wind accompanying heavy rain demolished one airplane and damaged two others at Junction City Airport. Falling limbs in Junction City damaged at least six automobiles.
Morris, Lyon, and Greenwood Counties, Kans.	10	2 a.m.					1,000	10,000	Hail and rain	In and near Council Grove in Morris County, roofs, windows, and crops suffered. From southern Lyon County south into Greenwood County, hail damaged roofs, broke windows, and destroyed gardens and crops.
Crawford County, Kans.	10	Morning					7,500		Electrical	Home and most of contents near Girard burned after lightning strike.
Pawnee County, Kans.	10	11:30 a.m.					2,500		do	About 5½ miles northwest of Larned, fire caused by lightning burned hay barn and 300 bales of alfalfa hay.
Boone County (southern portion), Nebr.	10	3-3:30 p.m.	*1-3	12			11,000	50,000	Hail	
Warren County, N. C.	10	3 p.m.						5,000	do	Area of damage 4 square miles.
Montoursville, Pa.	10	Evening					See remarks		Wind and rain	Thunderstorm at Airport with gusts to 78 m.p.h. before power failed. One-half inch of rain fell in about 5 minutes. Three planes and a car damaged considerably by gusty winds.
Smith-Osborne county border and Mitchell-Lincoln county border, Kans.	10	8 p.m.	See remarks	See remarks			10,000	200,000	Hail	From south of Harlan eastward along the Smith-Osborne county border, hail damaged several farms in narrow strip from 35 to 100 percent. Severe hail in Barnard area in path 8 miles long and 2 miles wide damaged roofs and flattened grain. Hailstones northeast of Barnard reported to be size of baseballs.
Gray, Ford, Edwards, Kiowa, and Comanche Counties, Kans.	10	9-11 p.m.			0	0	40,000	2,500	Wind, hail, and probable tornado	Wind, first reported at Cimarron where grandstand and an exhibit building at fairgrounds destroyed, swept eastward to Edwards, Kiowa, and Comanche Counties. Damage to several farms south of Kinsley, in Edwards County, and across line in Kiowa County, showed indications that tornado may have developed. Buildings destroyed or unroofed. South near Coldwater in Comanche County sheds damaged and trees uprooted. Hail caused considerable damage south of Cimarron and also near Bucklin. Most of property damage from wind.
Saline County, Kans.	11	10 a.m.						500	Electrical	Eighteen to 20 tons of new alfalfa hay destroyed by fire when lightning struck haystack near Assaria.
Russell County, Kans.	11	10:30 a.m.					300		do	Fifteen young hogs killed in shelter of granary which was struck by lightning near Lucas.
St. Louis, Mo.	11	3:50 p.m.				1	8,000		Wind and electrical	Lightning struck and burned one house. A live wire fell on boy, burning his back, when lightning struck a transformer.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Fort Leonard Wood, Mo.	11	Afternoon			2	10			Electrical and rain	Near edge of woods, a bolt of lightning killed two soldiers and injured 8 others. At another spot, tw men injured when lightning struck shack in which they had sought refuge from rain.
Captiva Island, Fla.	11	4 p.m.			0	0	$ 0	$ 0	Waterspout	Waterspout observed southwest of Blind Pass near Captiva.
Hagerman and vicinity, N.Mex.	11	6 p.m.	900					35,000	Hail and winds	600 to 700 acres cotton damaged.
Wilkes-Barre area, Pa.	11	Evening					See remarks		Electrical and rain	Several power installations struck by lightning, wit only slight damage in most cases. Heavy rains flooded streets and cellars in Wilkes-Barre when sewers were unable to carry water away fast enough.
Alexander County, N. C.	11	10:30 p.m.						11,000	Hail	Area of damage 2 square miles.
Baltimore, Md.	12	7 p.m.					5,000		Electrical and rain	House struck by lightning and most of second floor burned. Lightning damaged chimney of three other homes. Approximately 30 automobiles stalled at flooded crossroads. Many cellars in Logan Village filled with several feet of water.
Marshall County, Kans.	12	Night					1,000		Electrical	Registered Hereford bull killed near Summerfield when struck by lightning.
Raton (12 miles east-southeast of), N.Mex.	12						See remarks		Hail	About 40 head of cattle, driven down hill by hail, plunged into lake.
Oshkosh (18 miles southwest of), Nebr.	13	Evening	400	3	0	0	10,000	10,000	Tornado and hail	Small tornado.
Bladen County, N. C.	14	3 p.m.						55,000	Hail	Area of damage 2 square miles.
Eastern Polk, Red Lake, and Clearwater Counties, Minn.	14	5:15-7:30 p.m.	*2	25			14,000	66,000	do	Moderate to heavy hail that accompanied a severe thunderstorm caused considerable damage to growing crops and to real property. Some hailstones about the size of baseballs reported to have fallen in Mentor district. A number of fields of growing crops reported to be total loss. Much poultry and some small animals perished. Storm moved from southwest.
Eastern Polk, Red Lake, and Clearwater Counties, Minn.	14	5:15-8:35 p.m.	*5	25			15,000		Thundersqualls, with rai and hail	A few barns and outbuildings demolished. Houses and barns damaged. Poles and wires downed. Trees uprooted and many branches broken off. Storm moved from southwest, accompanied by heavy rains and hail.
Braham (and vicinity), Minn.	14	P.m.	1,760	8			500	50,000	Hail and rain	Heavy hail, accompanying severe thunderstorm, caused considerable damage to growing crops and some damage to real property. Some hailstones size of hens' eggs reported to have fallen. Some fields of grain and corn nearly a total loss. Storm moved from northwest, with heavy rains.
Northern Chester and southern York Counties, S. C.	14	8 p.m.					5,000		Thunderstorm	Damage to electrical transformers and wires caused interruption of electrical services.
Turner, Mont.	14	9-10 p.m.	*8	12				Slight	Hail	
Botetourt and Rockbridge Counties, Va.	14-15	Night					40,000		Rain	Flash floods in tributaries of James River damaged secondary roads and five small wood bridges. Main Route 11 blocked for a number of hours with rocks and debris washed from swollen Whistle Creek.
Ardmore Municipal Airport, Carter County, Okla.	15	3:28-4:28 p.m.	100	1/3			500		Wind	Portion of sheet metal roof of hangar blown off; two aircraft and radio station antennae damaged.
Greenville, S. C.	15	Afternoon				2	15,000		Electrical and wind	One house burned down and about 15 more damaged by fires from lightning. About 400 transformers hit and many damaged. Many trees blown down and uprooted.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Okeene (7 miles east of), Kingfisher County, Okla.	15	4:20 p.m.	100		0	0	$3,000	$ 0	Tornado	Ripped off roof of combined service station and residence on Highway 51. Observer reported three funnels touching ground. Damage from others minor, consisting of trees.
Rush City (and vicinity), Minn.	15	5 p.m.		25			10,000	50,000	Thundersqualls, with rain and hail	A number of small farm buildings and silos wrecked. Trees uprooted. Storm moved from northwest, accompanied by heavy rains and hail. Hail caused considerable damage to growing crops and some damage to real property. Hailstones varied in size, some being 1½ inches in diameter. Some fields of grain damaged 15 to 20 percent.
Baltimore, Md.	15	P. m.				2			Electrical	Two persons treated for burns and shock after they were struck by lightning when seeking shelter under a tree.
Pylesville, Md.	15	P.m.			4				Thunderstorm and flash flood	Four persons drowned when caught in a flash flood as they sat in an automobile stalled on bridge near Pylesville.
Frederick County, Va.	15	Night					5,000	20,000	Wind and hail	In White Hall section roofs blown from buildings, farm crops destroyed, telephone lines downed, and trees uprooted. Hailstones extensively damaged apples, peaches, corn, and other crops.
Fluvanna County, Va.	15	Night					5,000		Electrical	Service station struck by lightning and burned.
Birch Creek, Mich.	15	10:30 p.m.					10,000		do	Barn struck by lightning, resulting in fire that consumed barn and hay stored within.
Northeastern Emmons County, western Logan County, and northwestern McIntosh County, N. Dak.	16	Shortly after midnight						100,000	Hail and winds	Storm traveled southeastward from east of Braddock to a point southeast of Napoleon. In this area losses ranged from 25 to 100 percent. Another storm path between Wishek and Ashley was about 8 miles wide and 20 miles long, with 20 to 100 percent loss. Some wind damage occurred in addition to the hail. It knocked down some of the best crops seen in more than 30 years in that area.
Clayton County, Iowa	16	1:30 a.m.	*3	10			See remarks	80,000	Hail, rain, and wind	Storm struck 8 miles east of Elkader and north toward Farmersburg; 40 farms hit, some total crop lost. Hail 1½ inches in diameter. Storm moved from northwest.
Jackson County, N.C.	16	3 p.m.					8,000	10,000	Hail	Area of damage 4 square miles.
Tolland and Windham Counties, Conn.	16	5-6 p.m.					12,000		Thunderstorms	Five barns destroyed in Brooklyn, Hampton, and Stafford areas; also 40 tons of hay and 3 cows.
Layton, Sussex County, N. J.	16	P.m.						1,000	Hail	Crop damage in scattered areas in vicinity of Layton.
Medicine Lake, Mont.	16	6:30 p.m.	*10-15				500,000	500,000	Hail and wind	Hailstones up to 3 inches.
Vida, Mont.	16	7 p.m.	*10				Considerable	1,000,000	Hail	Storm moved eastward as far as North Dakota line. Hail up to size of hens' eggs.
Norborne to Carrollton, Mo.	16	7-9 p.m.	*5	10			25,000		Wind	Bottomland under water at time of storm. Rather high waves added materially to destruction of homes, especially in Norborne.
Nemaha (northeastern portion), and Brown Counties, Kans.	16	7:30-8:30 p.m.			0	0	500		Wind and tornado	Violent wind, moving in from northeast, caused damage to trees and power lines in Hiawatha and Sabetha areas. A small funnel-shaped cloud sighted aloft to north of Hiawatha. Strong northeast wind also noted about same time in Jefferson County.
Orange, Va.	16	8 p.m.					1,000		Electrical	Barn struck by lightning and burned.
Richmond, Va.	16						500		do	Some masonry knocked from parapet of John Marshall High School and minor damage done to some transmission lines in city and outskirts.
Morton County, N. Dak.	16	Night					See remarks		Hail	Damage reported to range from 5 to 80 percent in vicinity of New Salem.
Kent and Sussex Counties, Del.	16					1	See remarks	See remarks	Electrical, rain, and wind	Barn burned completely after it was struck by lightning near Harrington; $5,000 worth of stored crops destroyed. In Dover trees downed by wind, two homes damaged by lightning, with damage of $1,600; electric

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										power off for several hours; streets became surging ponds and streams in many places. In Smyrna a boy deafened by thunder and had to be treated. In Milford water flooded homes and a dry goods store causing much damage. Near Georgetown fields of corn flattened, fences damaged, and poultry killed by limbs hurled through the air by wind. In Lincoln a bolt of lightning struck a home, ripping off plaster in three rooms, breaking 16 windows and knocking telephone off wall.
Weld County (southeastern portion), Colo.	16	Late p.m.	*1½	3			$20,000	$50,000	Hail and rain	Greatest losses to crops, mostly wheat, by hail that accumulated to depths of 5 to 6 inches. High water damaged roads and bridges, overflowed farm land, and filled basements.
Cortland County and area northeast of Cortland Village, N.Y.	16	Late evening					10,000	3,000	Hail and wind	Total destruction to crops in limited area. Size of hailstones varied from 5/8 to 1½ inches in diameter, covering ground. Farm buildings and automobiles suffered severe damage.
Centralia, Ill.	17	4 a.m.					30,000		Electrical	A lightning-set fire destroyed premises of three business firms.
Wilkes-Barre area, Pa.	17	8-8:30 a.m.					See remarks		Electrical and rain	Lightning struck dry-cleaning plant in Ashley and caused $300 loss. Transformer hit and burned out by lightning in Plymouth. Heavy rain flooded streets of Ashley for 20 minutes.
Newtown, Va.	17	2:30 p.m.					800	300	Wind	Farm house unroofed; another suffered minor damage, as did corn crop in nearby area.
Rhode Island and northern parts of Tolland and Hartford Counties, Conn.	17	3-5:30 p.m.					65,000	200,000	Thunderstorms, hail, and wind	Damage to long-leaf tobacco fields by heavy downpours and hail (in places size of walnuts); large barn, and 40 cattle destroyed at Foster, R. I. ($20,000); at North Kingstown, R. I. large barn ($15,000); and at Portsmouth, R. I., poultry houses, and 3,000 chickens ($25,000).
Wayne County, N. C.	17	3 p.m.							Hail	Area of damage 5 square miles; damage 5 percent.
Carmi, Ill.	17	4 p.m.					24,150	5,000	Wind and rain	A locally severe thunderstorm caused extensive wind damage in Carmi, while heavy rain caused some crop damage in lowlands.
Granville County, N.C.	17	5 p.m.						2,000	Hail	Area of damage 1 square mile.
Rawlins County, Kans.	17	5-6 p.m.					2,000	10,000	Hail, wind, and rains	Severe wind and hail, accompanying torrential rains, caused considerable damage to crops and buildings in strip across northern part of County from point 5 miles northwest of Beardsley to 4 miles north of Atwood. Wind damage to property, $2,000; to crops, $2,000.
Sheldon (and vicinity), Iowa	17	5:45 p.m.	*5	10	0	2	19,000	90,000	Tornado, rain, and hail	Tornado moved southward. Automobile blown off road; 2 persons injured. Walls and roofs of four buildings collapsed; small porches taken off; power and phone lines downed; plate glass windows blown out; trees uprooted; and crops damaged. Rain and hail accompanied storm; hail size of large peas.
Ottawa County, Kans.	17	8 p.m.					10,000		Electrical	Barn and contents, including six calves, feed, hay, saddle, and motor, burned on farm near Wells after lightning strike.
Langley, S. C.	17	Night					750		Wind	Electrical services interrupted as falling trees pulled down wires. One automobile crushed beneath a falling tree.
Harold, Fla.	17				1				Electrical	Child killed by lightning.
Madison, Fla.	17						Small		Wind and hail	High wind downed wire lines. No damage from hail.
Jefferson and Atchison Counties, Kans.	18	3:15 a.m.	1,760	3½				2,000	do	Hailstorm, moving from north, damaged crops in small area mostly east and south of Valley Falls. Hailstones reported to be size of marbles and quail eggs. Slight wind damage to power lines in Atchison County at about same time.
Meadow View, Md.	18	10 a.m.					5,000		Electrical	Interior of house and furnishings burned by fire after lightning struck house.
Shippensburg, Pa.	18	Daytime			1				do	Farm boy struck and killed by lightning in an open field.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Bath County, Va.	18	1:30-3 p.m.	880	20			$200	$4,500	Hail	Gardens ruined and considerable damage to corn from Little Buck Creek (Mountain Grove) across the County into Augusta County.
Forsyth County, N.C.	18	4 and 9 p.m.					10,000	260,000	do	Area of damage 2-1/4 square miles.
Nash County, N. C.	18	4:30 p.m.			1	2			Electrical	Woman killed by lightning at Middlesex.
Wolverine, Mich.	18	6:30 p.m.	*2	10		2	°10,000	°	Wind and hail	Hailstones 3/4 to 1½ inches in diameter damaged roofs, windows, cars, and crops.
Fort Wayne and vicinity, Ind.	18	7 p.m.	*10-15				25,000		Wind, rain, hail, and electrical	Power and telephone lines, trees, autos, and homes damaged. Several homes damaged by lightning.
Ainsworth (10 miles north of), Nebr.	18	7:45 a.m.	*3	7			Slight	5,000	Hail	
Phoenix - Mesa area, Ariz.	18	9:58 p.m.	*20	30			°17,500	°	Electrical and rain	Most severe portion of thunderstorm struck Mesa. High wind unroofed warehouse, smashed display windows, and blew down six power poles. In Phoenix, broken limbs of trees disrupted power and communications. Lightning struck one house, causing $3,500 damage. Storm moved northwestward. Wind damage approximately $10,000; rain damage about $4,000.
Trenton, N. J.	18	P.m.	200	3			2,500		Electrical	Lightning struck and partially demolished large chimney of county jail; also put several high voltage lines out of commission.
Chatham County, Va.	18	Late p.m.					1,000		do	Stable and barn burned after being struck by lightning.
AP Hill Military Reservation, Va.	18	Night			1				do	Officer died during violent electrical storm after lightning had struck nearby transformer and may have traveled along electric wires leading into his tent.
Hopewell Airport, Va.	18	Evening					100,000		Wind	Two walls ripped away from hangar and roof damaged. Plane moved outside the hangar was torn from its stakes and became a total loss. Seven other planes, five of them inside hangar, damaged.
Blackstone, Va.	18	10 p.m.					See remarks		Electrical and wind	Main power system at airport out of order for more than 24 hours. Emergency power used. About 40 telephones, as well as transformers and street lights, in Blackstone knocked out.
Bedford, Ind.	18	11:30 p.m.					20,000		Wind, rain, and hail	Plate glass window blown out. Trees, houses, and electric lines damaged.
Madison, Fla.	18							1,100	Electrical	Twenty-three fine hogs killed by lightning.
Cumberland County, N.C.	18				2				do	Two officers at Ft. Bragg killed by lightning.
Rowan County, N. C.	18				1				do	Man killed by lightning at Salisbury.
Machinac Island, Mich.	18						See remarks		do	Church severely damaged by fire caused by lightning.
Sanilac County, Mich.	18						°150,000	°	Wind and hail	Six barns and other farm buildings blown down in Custer and Deleware Townships. Walnut-size hailstones destroyed crops.
New York, with most damaging effects in central half	19	All day					500,000	500,000	Electrical wind, rains, and hail	By early morning of 19th a severe squall line of severe thunderstorms with heavy rain, hail, and high winds, oriented from northeast to southwest, had moved into western New York, preceding leading edge of cooler air from central and western Canada. The cooler Canadian air, pushing eastward and southward, replaced warm and moist southerly flow of tropical air. Storms began before sunrise and continued throughout day as squall line moved eastward. Most severe damage in central half of State, covering entire area from Lake Ontario to Pennsylvania border. Gale winds, torrential downpours, and severe thunderstorm conditions throughout most of storm area caused severe damage to crops, trees, and buildings. Local flash flooding in small streams throughout area. No flooding in larger rivers. At Bainbridge in south-central part of State, local streams

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										flooded their banks with severe local damage. Reported to be worst flood conditions in history of village and damages estimated to reach $100,000. At Syracuse, storms struck around dawn, with gale winds, a near cloudburst of over 1 inch of rain in 15 minutes, and a violent electrical storm. In nearby area winds estimated to have reached gust speeds in excess of 75 m.p.h. Some evidence of a tornadic swirl. Hundreds of trees uprooted, smoke stacks toppled, homes damaged, crops ruined in many instances, telephone and power lines knocked out, and widespread "washout" damages. Damages in the Syracuse area estimated at around $500,000. In Utica-Rome area over 3,000 homes without power, railroads and highways blocked as result of washouts, and severe damage in muck-land, crop areas as result of flooding. Fifty trees blown down in a half mile stretch near Herkimer, showing intensity of storm. As squall line reached eastern end of Mohawk Valley it decreased in its damaging effects and only minor damages reported from Schenectady area eastward. No serious damages in Hudson Valley or in far north.
Maine, New Hampshire, Vermont, Massachusetts (except Cape Cod area), Rhode Island, and Connecticut	19	All day			2	7	$700,000	$300,000	Electrical and rain	Tobacco damage at Broad Brook, Conn., estimated at $300,000. Deaths from lightning at Bridgeport and Ellington, Conn. Hundreds of buildings struck in 6-State area; 30 strikes listed in Metropolitan Boston. Torrential rains flooded highways and basements, ruining merchandise, particularly in environs of Clinton, Mass., (3.60 inches in 6 hours); Rockland, Me., (4.62 inches in 5 hours); and Providence, R. I., where tide developed back pressure retarding drain-off and flooding business section. Homes and barns destroyed at numerous places, livestock in at least 2; 6 Holstein cattle in Carlisle, Mass., and 2 in stalls in Methuen, Mass. A truck with inflammable cargo valued at $6,000 destroyed in Lincoln, Me.
Chester and Philadelphia areas, Pa.	19	12:30-5:30 p.m.			3	13	See remarks		Electrical, wind, and probable tornado	Three separate storms. Cars and power and telephone lines struck and damaged by falling trees. A "twister" reported to have gone through Sackville section of Brookhaven road, felling trees. In Upper Darby boy blown against building, receiving head injuries. In Philadelphia a man was struck by flying glass from a window broken by wind. Lightning struck brick chimney of hospital, sending bricks through roof and injuring 4 patients. Two men killed by lightning and one killed in fall from a roof. Lightning killed 3 cows near Brookhaven. In Lansdowne, lightning set fire to a house. Nine row houses unroofed, making 30 persons homeless. Screens blown from windows and many windows broken by high winds. A 3-story apartment house unroofed, as were 2 neighboring buildings. Wind blew a tugboat aground in Delaware River. One severe blow tipped a big elm tree against a 3-story home, and a short time later another severe blow righted the same tree. Seven persons marooned in their cars when 4 to 5 feet of water suddenly caught their cars in low sections.
East Rainelle and immediate surrounding area, W. Va.	19	1:20-1:40 p.m.					See remarks	See remarks	Hail	Roofs destroyed, automobiles dented, and glass broken. Among the crops, corn, tomatoes, cucumbers and beans suffered heaviest damage. Total damage estimated at $25,000.
Culpeper County, Va.	19	2-4 p.m.					See remarks	See remarks	Wind and hail	Roofs and windows of a few buildings severely damaged. Slight damage to corn.
Bradford and Sullivan Counties, Pa.	19	3-5 p.m.					See remarks	See remarks	do	Rome-Leraysville and Dushore areas hardest hit. Many trees blown down, disrupting power and telephone services in eastern Bradford County. Heavy hail riddled corn and other crops in parts of these counties.
Pennsylvania, central portion	19	Afternoon				1	See remarks	See remarks	Electrical, winds, and hail	Lightning struck and damaged a home in Hummelstown, a farm building in Hockersville, and a store in Hershey; shattered a chimney in Steelton; disrupted utilities in York and Chambersburg; and killed 4 cows and seriously injured a fifth near Waynesboro. In Harrisburg a man injured when he fell on a wet beam at an apartment house project. At Indiantown Gap Military Reservation, high winds broke windows, blew over sheds and range towers, and blew a tree across power lines. Crops damaged by high winds and heavy rains in several sections, and trees blown down or had branches torn off in many localities. Newport reported an inch of hail on ground following thunderstorm there.
Bedford, Va.	19	Afternoon						3,000	Hail	Much tobacco riddled in Walton Store section.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
From Couch to Mohr's Store, Mason County, W. Va.	19	Afternoon	Several hundred					$500	Hail	Damage to tobacco, corn, and leaf crops. Hailstones up to 1 inch in diameter.
Richmond, Va.	19	4-4:30 p.m.				2	$100,000		Electrical and wind	One person injured by wind-blown board, another by wind-slammed door. DC-3 plane damaged while on ground at Byrd Field - wind whipped one elevator off, broke the other, and damaged both ailerons. Four major power breaks occurred. Constellation made crash landing in hay field during storm with considerable damage to ship, but no injuries to 56 persons and crew. Many traffic accidents. Many trees blown over.
Patrick County, Va.	19	4:30-5:30 p.m.	*3	30				15,000	Wind and hail	Tobacco, corn, and buckwheat crops damaged in southern sections of County.
Chestertown, Md.	19	4:30 p.m.					See remarks		Thunderstorm and wind	At least 100 trees blown down, blocking almost every street in town. Court house lawn had 20 trees damaged by wind. Electric lights and telephone services disrupted for several hours.
Henry County, Va.	19	5-6 p.m.						10,000	Hail	Tobacco and corn damaged in Ridgeway section.
Surrey County, N. C.	19	5 p.m.						204,000	do	Area of damage 300 square miles; mostly tobacco.
Granville County, N. C.	19	5:45 p.m.						5,000	do	Area of damage 2 square miles.
Camden, Hunterdon and Burlington Counties, N. J.	19	P.m.					1,000	25,000	Hail and wind	Considerable fruit crop damage due to hail.
Cambridge, Md.	19	P.m.			1			See remarks	Thunderstorm and wind	Man killed while working on power line. Extensive damage to corn and tomato crops.
Laurel, Del.	19	P.m.			1				Rain	Child killed when driver failed to see him because of heavy rain.
Bristol, Va.	19		1,760	1			2,600	100,000	Hail	Considerable damage to tobacco, corn, and alfalfa crops, homes, nine planes at Briston Airport, and a greenhouse.
Runa, Nicholas County, W. Va.	19				1		Slight	Slight	Electrical	Man killed by lightning.
Matoaka (near), Mercer County, W. Va.	19				1				do	Woman killed by bolt of lightning which went down chimney and through house.
Farmington (near), Marion County, W. Va.	19				1				Rain	Automobile skidded on wet pavement during rainstorm and crashed into truck, killing driver of automobile.
Utah, north-central counties	19-21						Negligible	See remarks	Hail	Crops damaged in southwestern Utah County and in vicinity of Tooele. Observer from Scipio reports approximately $10,000 damage (unconfirmed) to crops in northeastern Millard County. Slight damage reported in parts of Utah and Wasatch Counties.
Bovina (north of), Colo.	20	6-7 p.m.	*5	11				45,000	do	Heavy hail destroyed practically all crops, mostly wheat, in area between Arickaree and Hell Creeks north of Bovina.
Paonia (near), Colo.	20	P.m.				2	200		Electrical	Man seriously burned by lightning and his son knocked unconscious while working in hay field, but son suffered no lasting ill effects. One of the horses driven by the man was killed.
Mercer, Burlington and Camden Counties, N. J.	20	P.m.			2	5	5,000	10,000	Rain, wind, and electrical	Heavy driving rains and high winds caused one major and several minor traffic accidents and one death. Lightning struck and killed one man.
Hennepin County (southern portion), Minn.	20	9-9:30 p.m.		18	5	See remarks	6,000,000	See remarks	Tornado and rain	Most damaging tornado of record in Minnesota. Originated in Lake Minnetonka area and moved eastward through Richfield Township, South Minneapolis to Wold-Chamberlain Airport where about 63 airplanes destroyed and about 37 others damaged. Several W.M.L.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										hangars, some military barracks, and other buildings demolished or severely damaged. Several homes completely demolished. Property damage extensive in Minneapolis, St. Paul, and vicinity. Power and communication lines seriously affected. Hundreds of trees blown down, with damage to roofs and automobiles. Scores injured. Excessively heavy rains caused much flooding. Growing crops damaged.
Minnesota, extreme southern and southeastern counties	20–21	P.m.–a.m.				2	$250,000	See remarks	Thunder-squalls, with tornadic winds, rain, and hail	Many barns, outbuildings, silos, and windmills demolished. Numerous large farm and town buildings and grandstand at Fair Grounds damaged. Power and communication lines downed. Many trees uprooted. Much poultry and some livestock perished. Growing crops damaged. Heavy rains and hail accompanied storm. In Madison area, storm assumed tornadic proportions.
Minnesota, extreme southern and southeastern counties	20–21	P.m.–a.m.					10,000		Electrical	A number of places struck by lightning. A barn, nea Kellogg, entirely destroyed by fire after being struck by lightning, and 6 head of livestock killed. A home near St. Charles damaged considerably by fir after being struck by lightning.
Minnesota, extreme southeastern counties	20–21	P.m.–a.m.			1	1	See remarks	See remarks	Rain and flood	Heavy to excessive rains that accompanied unusually severe thunderstorms flooded numerous basements and many main floors of homes and business establishments. Streets, roads, highways, and lowlands inundated. Railroad tracks and bridges washed out. Muc soil erosion occurred. Growing crops lodged, washe out, or drowned. Traffic seriously delayed. A woman killed and her husband injured when their automobile struck an undermined road. Flash floods occurred in a number of small rivers and creeks in extreme southeastern Minnesota; many families evacuate
Valley County (southern half), Nebr.	21	1:20 a.m.	*20	40			11,500	$155,000	Hail and wind	
Wilson County, Kans.	21	7 a.m.					12,000		Electrical	Almost total loss to building and contents of garage and welding shop from lightning strike in Altoona.
Wisconsin, entire State	21	A.m.			1		200,000	50,000	Winds, rain, and electrical	High winds, heavy rain, and lightning caused scattered damage over State. Considerable disruption o telephone and electric services in Lake Winnebago section. Considerable number of trees blown down; also a number of barns. Some property loss from fires started by lightning. Church near Reedsville Manitowoc County, badly damaged by high wind. Heav rain caused considerable soil erosion in some sections.
Carbondale (8 miles south of), Colo.	21	9:30 a.m.-6 p.m.	*6	10			5,000	200	Hail and rain	Storm in mountainous area; damage mostly to highways and roads from heavy downpour and numerous landslides. Some damage to lawns and gardens.
North Towanda, Pa.	21	Noon			0	0	See remarks		Tornado	A small "twister" struck in Hemlock Run, picked up a large quantity of hay from a field and dropped it across 33,000 volt transmission lines, starting a fire and damagling lines, poles, and insulators.
Panguitch (east of), Utah	21	2–4 p.m.	*4	10			8,200		Rain and hail	Heavy thundershowers with moderate hail. Damage to bridges and irrigation canals. Three undershots of canals crossing Sand Wash completely destroyed and one on Peterson Wash.
Brooksville, Fla.	21	Afternoon							Hail	Stones were flat, about 1 inch in diameter and half inch thick.
Hoke County, N. C.	21	5:30 p.m.						5,000	do	Area of damage 1 square mile.
Northern Lincoln and western Kit Carson Counties, Colo.	21	P.m.	*20	40			10,000	95,000	Wind and hail	Hail accompanied by winds of almost tornadic velocit In some places hailstones as large as hens' eggs. I addition to damage to crops, windows were broken an smaller farm buildings blown over.
Kalamazoo, Mich.	21	7 p.m. to 1 a.m.				2	107,000		Rain and electrical	Heavy rain flooded basements and washed out roads. Lightning knocked out utilities and injured 2 people.
Tucson, Ariz.	21	7:55 p.m.			1	11	°500	°	Dust	Local dust storm 2 miles north of Tucson on Casa Grande highway. Two trucks carrying cotton workers collided during dust storm. When one truck stopped, the following one struck it, forcing it into path o an oncoming car.
Hillsdale, Mich.	21	Evening					°3,000	°	Rain	Heavy rain of about 6 inches washed out roads and crops.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Sherman County, Kans.	21	Night					$500		Wind (tornadic)	Wind, with some evidence of a small tornado, picked up a 3,000-bushel steel grain bin and deposited it in yard some distance away; also, caused minor damage to fences, light poles, and power lines.
Rooks County, Kans.	21	Night			0	0	600		do	Wind, with tornadic characteristics, caused considerable damage to roofs and porches on farm near Stockton, and scattered damage in Plainville and Zurich.
Willis, Mich.	21	11 p.m.			0	0	°10,000	°	Tornado and electrical	Small tornado destroyed several farm buildings. Lightning caused barn to burn down.
Quincy and northern Adams County, Ill.	21–22	11:30 p.m.–7:30 a.m.					152,500	$750,000	Rain	A 6-inch rain resulted in flash flood conditions in Lima Lake drainage area. Property damage largely confined to bridges and culverts and utility lines.
Cloud County, Kans.	22	12:50 a.m.	•2	8	0	0	2,000		Tornado	Small tornado moved in path from 4 miles northwest of Aurora southeastward through Aurora to 4 miles southeast. Plateglass windows in town broken, while several farms in path suffered damage to roofs, windmills, small buildings, and trees.
Ruskin, Fla.	22	4:20 p.m.			0	0	2,000		do	Tornado moving northwestward destroyed one small home and caused other minor damage.
Stafford County, Kans.	22	Night					3,000		Electrical	Granary and contents of antique furniture, books, and oriental objects of art burned near Stafford after being struck by lightning.
Elliston, Ind.	22	11:45 p.m.	•1	4				2,500	Hail	Damage to corn and gardens.
Rodeo, N.Mex.	22								Tornado	Tornado cloud reported by an American Airlines pilot, but funnel did not reach the ground.
Oklahoma City, Okla.	23	Afternoon					2,000		Wind and electrical	Entire wall of new stone block warehouse under construction blown over. Two homes struck by lightning; electrical damage of $500 included in total.
Ringgold, Va.	23	4:30 p.m.						See remarks	Wind and hail	Nearly 50 acres of full-foliaged tobacco damaged or laid waste by windstorm. Hail in its wake did further damage.
Tucson, Ariz.	23	8 p.m.	•3	10			°3,000		Electrical, wind, and rain	Main part of thunderstorm hit in Tanque, Verde, and Sabino Canyon areas plus northern portion of Tucson. Some flood damage to residences in low areas. Power failures due to lightning and broken wires. Several trees blown down. High wind damage $600; rain $2,100; lightning $300.
Leonardtown, Md.	23						See remarks	See remarks	Thunderstorm and wind	Trees uptooted, television antennae blown down, and three barns damaged. One barn completely destroyed with part of tobacco crop stored in it.
Pitt and Lenoir Counties, N. C.	24	4–6 p.m.						52,000	Hail	Area of damage 3 square miles.
Prince Edward County, Va.	24	5:30–6 p.m.	•2	8			5,000	25,000	Hail, and wind	Heavy damage to tobacco and corn; some buildings lost part or all of roofs in area from 2 miles west of Prospect to County line at Abilene R.R. Station.
Bourbon County, Ky.	24	P.m.			1				Electrical	Death caused by being struck by lightning.
Louisville, Ky.	24	P.m.					1,000		Electrical and rain	Four homes damaged by lightning. Some areas flooded and traffic tied up by flooded underpasses.
Burks Branch, Ky.	24	P.m.					10,000		Electrical	Lightning struck a church, starting a fire that ruined building.
Ocean City, Md.	24				1				do	Man struck and killed by lightning as he worked atop a power pole repairing a broken line.
Kalispell, Mont.	24–25						See remarks		Thunderstorm and wind	Some lines between Kalispell and Polson blown down. Teletypewriter communications out from about 12:15 to 8 a.m.
Augusta Springs, Va.	25	A.m.					See remarks		Rain	Little Calf Pasture Creek flooded its banks and covered Route 42 with 3 feet of water. Homes on either side flooded, with water in basements and to first floor level.
Sanford, Fla.	25	2–3 p.m.					Minor		Winds	Television antennae damaged by high winds.
Barber, Mont.	25	2:30 p.m.	1,760	10				2,500	Hail	Storm southwest of Barber on Fish Creek.
Oswego, S. C.	25	3:30 p.m.					500		Electrical	Lightning-set fire damaged 1 dwelling.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Moore County, N. C.	25	4 p.m.						$12,500	Hail	Area of damage 3 square miles.
Wolf Point, Mont.	25	Afternoon					Considerable		Wind	High wind blew over wall of school under construction.
Box Elder, Mont.	25	P.m.	°2	8				50,000	Hail	Loss mostly to wheat. Hailstones up to ½ inch.
Ekalaka, Mont.	25	8:45 p.m.		25				Considerable	do	Considerable damage in places.
Lansing, Mich.	26	Noon					$10,000		Winds	Winds blew down trees and several buildings.
Escanaba, Mich.	26	2:53 p.m. to 8 a.m.					°5,000	°	Rain, hail, and electrical	Rains of 3½ inches fell, with 1.41 inches in ½ hou flooded streets and basements. Hail damaged crop Lightning and wind damaged utility lines.
Becker, Hubbard, Ottertail, and Wadena Counties, Minn.	26	P.m.		50			550,000	See remarks	Thundersqualls, with tornadic wind, rain, and hail	A number of barns, outbuildings, garages, silos, a windmills demolished. Houses, barns and buildings damaged. Plate glass windows broken. Communication and power lines downed. Many trees uprooted. Several head of livestock perished. Growing crops damaged. General direction of storm northeastward. Greatest destruction in vicinity of Deer Creek where storm assumed tornadic proportions. Heavy rains and hail accompanied storm.
Becker, Hubbard, Ottertail, and Wadena Counties, Minn.	26	P.m.		50			50,000	150,000	Hail	Heavy hail caused much damage to growing crops and to real property. Some fields of grain reported to be a total loss. At Verndale, 6 miles east of Wadena, ground completely covered by hail, measuring from 6 to 8 inches in depth. Much poultry and some small livestock perished. Storm moved from southwest.
Meshoppen, Pa.	26	Evening			1				Electrical	Man electrocuted when he came in contact with a 900 volt line in a grass field that had been set afire The line had been weakened by an earlier stroke of lightning.
South Bend, Ind.	27	9 a.m.					10,000		Rain and wind	Streets flooded, autos covered, and basements, etc. damaged when sewers unable to carry off heavy rain Some damage from wind.
Greer, S. C.	27	Afternoon			1				Electrical	Woman killed when struck by lightning.
Madison County, N.C.	27	3 p.m.						2,700	Hail	Area of damage 1 square mile.
Arnett (near), Ellis County, Okla.	27	3:30–3:45 p.m.	440	10	0	0	2,000	1,000	Tornado, and hail	Tornado damaged two barns west of Arnett. Hail, go ball size, caused $1,000 damage to cotton crop; in cluded in total.
Frost, Navarro County, Tex.	27	4 p.m.	440	1			2,000		Wind	Two small frame buildings destroyed.
Jacksonville, Ill.	27	4:15 p.m.			1				Electrical	Woman killed by lightning.
Walden (southwest of), Colo.	27	5–6 p.m.			1				do	Man killed by lightning while working in hay field.
Montgomery, Ala.	27	P.m.				1	1,000		Thundersquall	Rear part of pharmacy gave way, apparently from weight of water from flooded store. Deluge caused parts of roofs of service station and furniture co pany to collapse. About 20 acres of land virtuall swamped. Basement of church and many homes flooded. Two apartments also swamped. Slight damage also at another furniture company. Policeman suffered leg injuries as his car skidded off pavement.
Phoenix area, Ariz.	27	6 p.m.	°10	30		2	160,000	50,000	Wind, rain, and flash flood	Series of severe thunderstorms accompanied by high winds covered Salt River Valley from Bradshaw Mountains to Chandler and from Tolleson–Phoenix area t Buckeye. Flash floods coursed down most washes wi lowland flooding concentrated along river bottoms from Tolleson to Buckeye. Flash floods inundated portions of Litchfield Park and Luke Field; temporary evacuation of 50 families when waters rose in housing area. Most lands flooded were desert, wit about 500 acres of cotton land flooded. Canals an ditches extensively damaged by flash floods. County roads washed out where crossing river bottoms without bridges. Wind damage $35,000; rain and flash flood damage about $175,000.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Sampson County, N. C.	27	6 p.m.						$37,000	Hail	Area of damage 1 square mile.
St. Louis, Mo.	27	6:20-7 p.m.	*4	5		2	Slight		Wind, electrical, and rain	A small, stagnant thunderstorm, affecting only south side of St. Louis, was accompanied by a brief downpour. Lightning caused the injuries.
Troy, Pa.	27	6:30-7:30 p.m.					See remarks		Electrical	Lightning set fire to barn about 6 miles southeast of Troy, destroying barn and contents with loss estimated at $20,000. During same storm, lightning killed 10 valuable cows about a mile south of Troy.
Allentown area, Pa.	27-28	During night			2	2	$200,000	See remarks	Electrical, rain, and hail	Newspaper estimates are for damage to homes, barns, and power lines. Lightning fire damage, $125,000; water damage, $75,000. One lineman fatally burned. Doctor killed when his car skidded on wet highway. Flashfloods put all Panther Collieries out of work and filled many cellars with water. Allentown-Bethlehem Gas Company rain gage showed a total of 5.77 inches, with about 5 inches in 3-hour period. First storm came from west about midnight; second came from south about 3:30 a.m., with final rain ending about 8:20 a.m. A ball of lightning, lasting about 20 seconds, seen during this storm. Gardens badly washed. Highways and streets littered with mud, sand, and stone from hillsides. One washout on Reading tracks. At least one street undermined by rushing waters. Many roads still had a foot of water on them after daybreak. Some hail, but major damage by water. Power company reported lightning storm worst to hit their lines. Lightning struck cement company works and caused roof to crash down on its kilns. Five barns burned to ground after lightning strikes, with total loss of $58,000. At Connerton, 9 families rescued by boat when streams rose to second-story levels.
Ridgefield, Bergen County, N. J.	27 and 28	P.m., 27th to a.m., 28th	*5	5		3	1,000	10,000	Rain, wind, and hail	Trees and wires downed. Flooded roads halted traffic and caused several minor traffic accidents. Hail damage to crops.
High Point and California, Mo.	28	12:30-1:45 a.m.					1,000		Electrical and rain	A telephone cable stripped for 485 feet by a sagging power wire when lightning struck nearby. About 150 telephones affected. A cow killed and electrical equipment burned out by lightning at High Point. Roads also damaged by ground washing, due to 4 inches of rain.
Buncombe and Haywood Counties, N. C.	28	2-3 p.m.						22,000	Hail and rain	Area of damage 10 square miles.
Cando, N. Dak.	28	Afternoon					10,500		Winds	High winds estimated at "twister speeds" caused damage to planes and municipal airport hangar. Two large sliding doors ripped off.
McHenry County (near Kief), N. Dak.	28	Late afternoon					See remarks	See remarks	Winds and hail	A farm near Kief, 45 miles southeast of Minot, badly damaged by wind and hail. Described as a tornado-like wind. Buildings badly damaged. A 500-gallon gas tank "literally disintegrated". Heavy damage to farm equipment. Most of the chickens in a brooder house killed, while a small brooder house nearby escaped damage. Large cottonwood trees uprooted. Crops completely flattened. Other farms also damaged.
Union and Passaic Counties, N. J.	28	P.m.					3,000		Rain	Highways and streets flooded, causing major traffic tieups and minor vehicular damage.
Washington, D. C.	28	6 p.m.			1	1			Electrical	Man killed by lightning and another injured after both had taken refuge from storm under tree on golf course.
Alexandria, Va.	28	6 p.m.			1				Rain and flash flood	Man drowned after taking refuge from storm under building on waterfront.
Wibaux (15 miles south of), Mont.	28	7 p.m.	*3	6			Slight	30,000	Hail	Damage to winter wheat.
Institute, W. Va.	28	8:34 p.m.					1,500,000		Electrical	Lightning struck a huge ethyl alcohol storage tank containing 1,600,000 gallons of alcohol used in manufacture of snythetic rubber. Explosion and fire caused damage.
Buncombe County, N.C.	29	3 p.m.					10,000		do	House burned at West Asheville as result of lightning strike.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Cibecue, Navajo County, Ariz.	29	4:30 p.m.			3	1			Electrical	
Yadkin County, N. C.	29	6 p.m.						$8,000	Hail	Area of damage 4 square miles.
Minneapolis-St. Paul (and vicinity), Minn.	30	A.m.					$40,000		Electrical and rain	A number of places struck by lightning. Several homes and stores in Minneapolis and St. Paul caugh fire after being struck by lightning. Telephone service at about 1,500 homes and electruc current at about 100 homes in the Twin Cities cut off. A large barn 5 miles west of Robbinsdale destroyed b fire after being struck by lightning. Heavy rains accompanied storm, causing additional damage.
Tucson, Ariz.	30	4:25 p.m.	*3				5,000		Winds	Squall in connection with thunderstorm had severe winds, for about 3 minutes, at Tucson Municipal Ai port, with gusts up to 57 m.p.h. Four light plane and four B-29's damaged, when they broke loose fro tie-downs.
Dubuque (near), Iowa	30	6:30 p.m.			1				Electrical	Lightning struck and killed boy on farm.
Yoder, Wyo.	31	6:30 p.m.						60,000	Hail and wind	All vegetation damaged, and in some places small grain a complete loss.
Suffolk and Middlesex Counties, Mass., and	31	7-8 p.m.				2	500		Electrical	Roofs and chimneys struck in Auburndale, Watertown and Belmont; 2 persons stunned.
Rockingham County, N. H.		8:30 p.m.-midnight				1			do	Ticket seller at summer playhouse knocked unconscious, later revived.

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* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Camdenton and vicinity, Mo.	8	5-7 p.m.	[a]20				See remarks	Slight	Wind	Damage largely to trees themselves and from limbs falling on buildings and wires. Several old barns and buildings blown over. Some small grain blown down.
Phelps County, Mo.	8	5:45-6:15 p.m.	1,000	6	0	0	[b]$5,000	[b]	Wind (possible tornado)	In Rolla several hundred trees damaged and wires broken. Few buildings affected. One garage lifted into air and set down in nearby field, without touching car inside. Five airplanes at Rolla Airport damaged, three extensively. Some ready to harvest oats and barley blown down.
Crawford County, Mo.	8	6-8 p.m.					25,000		Wind and hail	Slight damage by hailstones as large as 1 inch in diameter, followed an hour later by wind-driven rain. Steelville High School suffered most damage when large section of roof blown into front yard of school. Many phone and power lines broken. Damage to school alone about $10,000. Ten other roofs damaged.
Dent County, Mo.	8	6-7:30 p.m.	[a]10	40			25,000	$10,000	do	Falling trees near Salem blocked roads, broke power lines, and damaged roofs. A large barn demolished, and metal roofs blown off a mill and many small sheds. One auto smashed by tree. Heavy hail contributed about 10 percent damage. Path of storm reached from southwestern part of County to northeastern corner.
Carroll County, Mo.	15	7:45 p.m.			0	0	Slight	Slight	Tornado cloud and hail	Tornado cloud moving northeastward passed over Carrollton, but caused no damage in vicinity. Damage by hail in Bowdry Lake community, south of Carrollton, affecting corn, buildings, and automobiles.
Hickory and Dallas Counties, Mo.	25		1,000	20				40,000	Hail	Path of heavy hail damage extended from near Elkton and Pittsburg in southern Hickory County to beyond Urbana in northern Dallas County. In some parts of Dallas County such crops as corn, oats, wheat, and even pastures in the storm path completely ruined.
Springfield, Mo.	30	Midnight-4 a.m.					25,000		Electrical	A brick wall 9 feet high and 600 feet long of building under construction collapsed and steel girders broken off, twisted, lifted, strewn, or wedged into new resting places, apparently by compression wave of main bolt of lightning. In this unusual damage, there was no evidence of wind or excessive heat. Night watchman knocked to floor, stunned, but uninjured. Lightning intensely bright and almost continuous.

[a] Miles instead of yards.
[b] Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

MIDWEST FLOODS OF JULY 1951

The stage was set for the unprecedented floods on the rivers in eastern and north-central Kansas and northern and central Missouri during the latter part of May and the month of June. The rainfall in Kansas during the month of June averaged 9.6 inches, 5.63 inches above normal. Several counties in the eastern and west-central portions of the state had more than 12 inches of rain. The soil was, therefore, saturated with water before the heavy rains began in July.

METEOROLOGY

Torrential rains began to fall during the night of July 6-7 over the water-logged soil of northwestern and west-central Missouri, eastern Kansas and southeastern Nebraska where heavy rains had fallen on July 3-4. These heavy rains continued over this area for nearly two weeks with most of the rain occurring between the 9th and 13th.

In June and the first half of July strong cold air barriers were established with persistent recurrence over the Central Plains, its southern boundary being at about Oklahoma. These cold air masses were delivered to the Central Plains from the Gulf of Alaska and northwest Canada. The chief delivering agent was an unusually strong area of high pressure in the eastern Pacific which extended its influence up to at least 40,000 feet and poured supplies of cold air into the Northern and Central Plains. Coming up to meet these onrushing streams of cold air was a hot moisture-laden current of air from the Gulf of Mexico. The two currents met repeatedly in the Kansas-Missouri area, and there the warm moist stream of air, being lighter, was lifted over the cold air and forced to release its moisture in heavy rains.

Thus, the abnormally cold weather observed during June and early July in the Northern Plains and northern Rocky Mountain States and the very hot weather in the west Gulf States were evidence of the great contrasting streams of air whose interaction was responsible for the flood rains. Following the torrential rains over the lower Missouri Valley on July 6 and 7, a cold air mass moved down from the north over Nebraska, Iowa, Kansas and Missouri, with the front becoming stationary in southern and western Kansas and southern Missouri. As the high pressure system became stationary and began to recede very slowly eastward, warm frontal convergence action was again set up causing heavy to excessive rains during the night of July 9 and 10 over most of eastern Kansas and south-central Nebraska, with torrential downpours at some points, White City, Kans., reporting an unofficial amount of 7 inches.

Heavy to excessive rains occurred again during the night of July 10-11, with torrential amounts in central Kansas, Barnard reporting 7.75 inches and Harveyville, 7.42 inches.

Rainfall during the night of July 11-12 was not quite as heavy in northeastern Kansas as it was on previous days, the area of heavy rainfall having moved westward over northwestern Kansas and southward over southeastern Kansas. The cold air mass was beginning to push slowly southward carrying the heavy rain farther to the southward and southeastward.

THE FLOOD OF 1951

These heavy rains during the two-week period in July resulted in the most severe floods of record along the Smoky Hill, Saline, Solomon, Kansas Marais des Cygnes, Cottonwood and Neosho Rivers Unprecedented flooding also occurred near the mout of the Republican River at Junction City, Kans Severe overflows, approaching record heights i many instances, took place on the Little and Bi Blue Rivers. In some instances legendary data wer not superseded; however, the overflows were th worst in modern records which cover the past cen tury.

The Missouri River was running several feet lowe than normal at Kansas City, Mo., at the height o the Kansas River flood, but the Missouri River, bi as it is, could not handle the flow from the Kansa River. It reached the highest level in over a cen tury at points below the mouth of the Kansas River Approximately 87% of the water came from the Kansa River Basin at the peak of the flooding.

The great flood of 1951, reached its climax i the Kansas City area on Friday the 13th of Jul when the dikes that protected the Central Industri al District in the valley of the Kaw lying betwee Kansas City, Kans., and Kansas City, Mo., broke an rapidly filled the Central Industrial District wit water to a depth of as much as 15 feet in som places.

Some flooding of the main stem of the Missour River occurred during the first week to ten days o June from Nebraska City, Nebr., downstream throug Waverly, Mo., except in the Kansas City area. How ever, the major flooding in this area actually bega about the 20th of June. Flooding of that portion o the river above Kansas City was of rather shor duration, but from Kansas City downstream throug Jefferson City the river continued to spill over it banks at many points from about the 22d of Jun until about the 4th of July.

Major flooding in the Greater Kansas City area be gan on the evening of July 12. Flood waters entere the Argentine District, Kansas City, Kans., a 11:50 p.m. on the 12th. Flooding of the Armourdal District, Kansas City, Kans., began at 5:30 a.m. o the 13th, and 5 hours later it began in the Centra Industrial District. The fourth district to b flooded in Greater Kansas City was the Fairfax Dis trict located northwest of the confluence of th Kansas and Missouri Rivers. Flood waters entere this district at 6:30 a.m. on July 14.

The Missouri River reached a crest of 36.0 feet Kansas City, Mo., on July 14, 2 feet below the hig water mark of the 1844 flood, and an unprecedente high of 33.31 feet at Lexington, Mo., on the 15th At Waverly, Mo., the river swelled and spread such proportions that it was reported to be 8. miles wide where its normal bankfull level would only about 2,000 feet. In the Boonville, Mo., are the river rose to a crest of 32.82 feet on the eve ning of July 17. This was 7.7 feet higher than th previous record high crest of 25.1 feet establish in June of 1947. As the river's crest continued roll downstream toward the State Capitol at the ra of about 2.15 miles per hour, it again disregard its man-made constructions and at the time of th crest at Jefferson City had spread to a width of to 6 miles, whereas its normal width is 1,800 2,200 feet. Here as at other points along it course, the river rose to a crest stage second onl to the flood of 1844. At Hermann, Mo., where ga records have been kept since 1873, the crest of 33. feet on the 19th was the highest stage ever record at that point, exceeding the previous highest sta of record (31.1 feet in 1943) by about 2 feet.

St. Charles, Mo., where gage records have been kept since 1918, the July 1951 crest exceeded the previous record stage (35.4 feet in 1947) by about 2 feet. Highest stage at St. Charles was in 1844, when a high water mark referred to present datum gave 40.11 feet.

The upper Mississippi was unseasonably high during the passage of the Missouri crest, but the flow was considerably less than in 1947. Flooding in the lower portion of the upper Mississippi River from St. Louis to Cape Girardeau, Mo., was severe and was exceeded in severity only by the flood of 1844. At St. Louis, Mo., where gage records have been kept since 1861, the crest of 40.28 feet on the 22d was the highest gage reading of record, being exceeded only by the flood of 1844 when a high water mark reading of 41.39 feet was established. The previous highest gage reading of record was 40.26 feet in July 1947. Chester, Ill., gage readings began in 1892, and the crest reached in July 1951 (39.3 feet) was the highest gage reading of record, exceeding the previous highest stage of record of 38.1 feet in 1947 by 1.2 feet. Highest water of record at Chester was in 1844 when a high water mark, referred to present datum, gave a height of 39.87 feet. The Mississippi River at Cape Girardeau, Mo., approached within 0.1 foot of the 41.9 foot crest of 1947 and within 0.6 foot of the 42.4 foot crest of 1943. The highest water of record at Cape Girardeau, Mo., was in 1844, when a high water mark gave a height of 42.5 feet.

Phenomenal flooding occurred along the Cottonwood and Neosho Rivers in the Arkansas Basin due to the heavy rains during the first part of July. Some measure of the severity of the July floods along the Neosho River in Kansas is indicated by the fact that all-time record stages were broken by as much as 9 feet. In some instances peak flows are believed to have been 4 to possibly 5 times greater than any previous known records. The Verdigris flood was pushed into the backgroung by the Neosho flooding, but it too was a major flood. The crest stage at Independence, Kans., on July 1 was within one foot of the all-time record set in May 1943.

Severe flooding occurred over the Big Slough area 6 to 8 miles west of Wichita, Kans., on July 1 due to the failure of a dike at Maize, Kans. A large newly-developed residential area was damaged as the water rose to the floor level in many houses. Moderate flooding occurred along the Little Arkansas River from Sedgwick through Wichita, Kans. The Arkansas River at Wichita rose to within 0.1 foot of the previous record stage on July 1. The Walnut River reached a stage of 38.25 feet at Winfield, Kans., 2.4 feet below the previous record stage of 1928.

Heavy rains during the week of the 8-14th caused rises to above flood stages on the Big Arkansas, Little Arkansas and to a lesser degree on Cow Creek and the Walnut River. Pawnee River was again a major contributor causing the Arkansas to rise at Great Bend, Ark., to a record stage of 11.18 feet. A dike broke at that stage and about 100 blocks of Great Bend was overflowed. Cow Creek contributed to the flow at Hutchinson, Kans., causing a new high stage record at that gage with considerable overflow of farmland to the south of Wichita. Severe flooding occurred along the Little Arkansas River at Halstead, Kans., with stages 1.5 feet higher than the 1944 flood.

A comparative crest table is given below showing the crests reached in the 1951 flood as compared to previous record floods:

TABLE I

COMPARATIVE FLOOD CRESTS

River and Station	Flood Stage	Previous Maximum Flood of Record		Crests During 1951 Floods	
		Stage	Date	Stage	Date
MISSISSIPPI BASIN					
Upper Mississippi:					
Grafton, Ill.	18	32.1*	6-1844		
		28.8	5-23-43	27.5	7-21
St. Louis, Mo.	30	41.4*	6-27-1844		
		40.26	7-2-47	40.28	7-22
Chester, Ill.	27	39.9*	6-1844		
		38.1	7-4-47	39.3	7-23
Cape Girardeau, Mo.	32	42.5*	7-4-1844	41.8	7-24
MISSOURI BASIN					
Saline: Tescott, Kans.	25	29.6	6-3-35	29.8	6-9
				30.2	7-13
Solomon:					
Alton, Kans.	12	24.5	8-1-28	22.6	6-23
				27.0	7-12
Beloit, Kans.	20	35.9	6-11-41	35.4	6-24
				39.3	7-13
Minneapolis, Kans.	26	32.0*	-1903		
		31.68*	-1941	32.2	6-27
		31.69*	-1942	34.14	7-21

TABLE I – Continued

COMPARATIVE FLOOD CRESTS

River and Station	Flood Stage	Previous Maximum Flood of Record		Crests During 1951 Floods	
		Stage	Date	Stage	Date
MISSOURI BASIN (Cont.)					
Solomon: (Cont.)					
Niles, Kans.	24	30.3	9-4-42	31.2 32.0	6-21 7-14
Smoky Hill:					
Salina, Kans.	20	24.64	5-30-03	24.1	7-13
Abilene, Kans.	22	27.3	5-29-03	26.3 29.41	6-28 7-14
Enterprise, Kans.	26	32.0	5-1903	31.4 33.9	6-28 7-14
Republican:					
Junction City, Kans.	10	18.2	6-3-35	14.3 18.8±	6-23 7-12
Little Blue:					
Endicott, Nebr.	9	16.2	6-9-41	17.7 15.4	6-28 7-12
Hanover, Kans.	14	25.0	6-10-41	22.1 22.3	6-28 7-12
Big Blue:					
Beatrice, Nebr.	16	27.65	6-23-47	28.3 18.51	6-4 7-7
Barnston, Nebr.	18	34.3	6-9-41	27.5 24.5	6(4-5) 7-7,12
Blue Rapids, Kans.	20	39.5	6-10-41	34.5 35.6	6-28 7-13
Randolph, Kans.	22	30.95	6-7-08	28.6 29.1	6-28 7-13
Delaware:					
Valley Falls, Kans.	22	29.7	6-16-25	32.3 25.4	6-21 7-12
Stranger Creek:					
Tonganoxie, Kans.	23	27.7	10-10-41	26.7 32.5	6-24,28 7-12
Kansas:					
Ogden, Kans.	18	28.5• 28.0	5-1903 6-3-35	23.4 30.5	6-29 7-12
Manhattan, Kans.	17	40.0• 27.9•	6-1844 5-29-03	26.8 33.5	6-29 7-13
Wamego, Kans.	16	26.3• 23.9	5-30-03 6-4-35	22.9 27.7#	6-29 7-13
Topeka, Kans.	21	42.2• 32.7• 28.0	6-1844 5-30-03 6-9-08	29.0 36.4	6-30 7-13
Lecompton, Kans.	17	29.5	5-31-03	24.4 30.23	6-23 7-13
Lawrence, Kans.	18	28.5	5-31-03	25.6 30.4	6-23 7-13
Bonner Springs, Kans.	21	25.2	6-18-43	25.7 38.9	6-24 7-13
Marais des Cygnes:					
Quenemo, Kans.	30	37.6	11-17-28	30.5 41.1	6-9 7-11
Ottawa, Kans.	24	40.0• 37.6	-1844 11-17-28	24.8 42.1	6-9 7-12

TABLE I – Continued

COMPARATIVE FLOOD CRESTS

River and Station	Flood Stage	Previous Maximum Flood of Record		Crests During 1951 Floods	
		Stage	Date	Stage	Date
MISSOURI BASIN (Cont.)					
Marais des Cygnes: (Cont.)					
Osawatomie, Kans.	28	44.3*	11-16-28	34.0	6-30
		42.5*	6-3-35	50.3	7-12
		42.1	4-17-45		
La Cygne, Kans.	25	32.2*	11-18-28	31.1	6-30
		30.0	6-4-35	36.2	7-13
Trading Post, Kans.	24	34.45	11-18-28	30.3	7-1
				38.1	7-14
Osage:					
Osceola, Mo.	22	45.3*	-1844	35.9	7-6
		41.5	5-21-43	35.1	7-19
Lakeside Dam, Mo.	60	65.4	5-2-43	64.4	7-7
St. Thomas, Mo.	23	43.8	5-20-43	35.0	7-9, 14
Missouri:					
Kansas City, Mo.	22	38.0*	6-16-1844	25.8	6-24
		34.95	6-2-03	36.0	7-14
Lexington, Mo.	22	27.9*	6-3-03	27.4	6-29
		25.8	6-7-35	33.31	7-15
Waverly, Mo.	18	25.1	6-24-47	26.8	6-30
				28.2	7-14
Boonville, Mo.	21	32.7*	6-21-1844	29.4	7-1
		30.9	1903 & 44	32.82	7-17
Jefferson City, Mo.	23	33.5	6-6-03	29.4	7-4
				34.2	7-18
Hermann, Mo.	21	35.6	6-1844	31.3	7-4
				33.0	7-19
St. Charles, Mo.	25	40.1*	6-27-1844	36.4	7-5
		36.8	6-8-03	37.3	7-20
ARKANSAS BASIN					
Little Arkansas:					
Sedgwick, Kans.	18	25.5*	7-6-04	22.9	6-30
		24.8	9-27-23	23.9	7-13
Ripley, Kans.	12	17.5	4-23-44	15.0	6-30
				15.4	7-13
Verdigris:					
Independence, Kans.	30	47.6	5-19-43	33.7	6-25
				46.6	7-1
				44.4	7-13
Coffeyville, Kans.	20	25.8	5-21-43	25.4#	7-2
				23.7#	7-14
Cottonwood:					
Cottonwood Falls, Kans.	9	16.0	4-23-44	16.4	6-30
			4-16-45	19.75	7-11
Emporia, Kans.	20	29.5	7-20-48	29.1	6-30
				33.33	7-11
Neosho:					
Emporia, Kans.	22	28.4	10-20-41	26.9	6-28
				29.4	7-11
Neosho Rapids, Kans.	22	29.9	7-21-48	24.8	6-9
				34.3	7-11

TABLE I - Continued

COMPARATIVE FLOOD CRESTS

River and Station	Flood Stage	Previous Maximum Flood of Record		Crests During 1951 Floods	
		Stage	Date	Stage	Date
ARKANSAS BASIN (Cont.)					
Neosho: (Cont.)					
Burlington, Kans.	27	36.73	7-21-48	28.8 41.53	6-10 7-12
Le Roy, Kans.	23	30.7	7-22-48	24.2 34.48	6-24 7-12
Iola, Kans.	15	24.6	7-23-48	16.7 33.4	6-25 7-13
Chanute, Kans.	20	30.9	7-23-48	22.8 38.6	6-25 7-13
Erie, Kans.	20	31.4• 27.2	-1927 5-26-38	27.5	7-15
Parsons, Kans.	24	31.2	7-27-48	40.2	7-14
Oswego, Kans.	17	27.4	7-27-48	19.3 32.5	6-28 7-15
Arkansas:					
Great Bend, Kans.	8	10.3	5-1-42	10.7 11.2	6-25 7-13
Hutchinson, Kans.	6	8.7	5-3-42	8.7 10.1	6-29 7-16
Wichita, Kans.	9	13.5	6-10-23	13.4 12.7	7-1 7-17
Arkansas City, Kans.	16	25.6	6-11-23	21.1 18.6	7-2 7-15

• High Water Mark
# Highest Observed Stage

FLOOD DAMAGES

The Midwest flood of 1951 was one of the most devastating floods in the history of our country.

Along the Kansas River Basin, half of the residential and all of the business district of Manhattan, Kans. were covered by flood waters. A large proportion of the flooded homes were considered a total loss. At Topeka, Kans., one-fifth of the city sustained severe damage. Personal flood loss in Topeka and adjacent rural areas north of the Kansas River was tremendous. Additional losses will accrue from damage to railroads, discontinued industry, property devaluation, and damage to crop land covered by heavy deposits of sand. More than 200 homes were destroyed and another 500 suffered 75 per cent damage in Topeka and adjacent areas. In Douglas County the agricultural loss was several million dollars with over one-third of the farms being subjected to flooding and much crop land was covered by heavy deposits of sand.

Along the Marais des Cygnes River, flood waters covered one-third of Ottawa, Kans., damaging over a thousand homes, and ranged from 16 to 18 feet deep on lower Main Street. At Osawatomie, Kans., half of the city was under water with hundreds of homes evacuated. Heavy losses occurred to state highways, railroads and rural property.

Along the Smoky Hill River, the property damage in Salina, Kans. and Saline County amounted to several million dollars. Flood waters from the Smoky Hill River poured water over the entire east side of Salina. The north part of the town was flooded as Dry Creek overflowed. Heavy damage resulted at Junction City, Kans., from the overflows of the Smoky Hill and Republican Rivers and at Fort Riley on the upper Kansas. One-half of the wooden buildings at Marshall Field were severely damaged with much loss to hangars and permanent buildings. Two-thirds of Camp Funston will require considerable or major rehabilitation work.

Major damages resulted in the Arkansas Basin from the record floods on the Cottonwood and Neosho Rivers. Fairly heavy damages were reported on the upper Verdigris and Chikaskia Rivers. The greater portion of the flood damages was to farm property and to crops in the field and in storage. Considerable damage was reported to highways and bridges. In the Neosho and Cottonwood Basins over 300,000 acres were flooded and approximately 2,500 homes.

Over 100,000 acres were flooded and over 100 homes suffered damage in the extreme upper portion of the Verdigris Basin. Only minor damages occurred along the main stem of the Arkansas in comparison with damages suffered elsewhere.

The monetary damages resulting from the severe flooding in the Midwest had not been reliably determined when this article went to press.

OTHER FLOODS OF JULY 1951

ST. LAWRENCE DRAINAGE.—Local flooding occurred along the St. Joseph River at Montpelier, Ohio, between the 10th and 14th due to heavy thundershowers during the night of the 8th and 9th. Considerable damage resulted to crops in bottom land.

ATLANTIC SLOPE DRAINAGE.—Heavy rain between 10 a.m. and 12 noon (1.12 inches) and 6:15 and 6:45 p.m. (2.12 inches) on July 19, 1951, caused the Susquehanna River to rise from 3 feet at 7 a.m. on the 19th to 7.9 feet at 7 a.m. on the 20th. Although the river stayed well within its banks (flood stage, 13 feet), Newton Creek, which is only about 3 miles long from its source in hill swamps and high pastures back of Bainbridge, N. Y., to its mouth in the Susquehanna River, overflowed its banks causing considerable damage in the village of Bainbridge. Bridges were washed out, gardens were ruined and basements were flooded. Water ran almost 2 feet deep in West Main Street near the village fire hall. The crest of the flood struck about 7 p.m. and by 9 p.m. it was almost over, leaving thousands of dollars of property damage and cleanup work. Estimates of damage reached $58,250 as reported by the Zone Engineer of the Corps of Engineers, U. S. Army, stationed at Binghamton, N. Y.

Flash floods in tributaries of the James River in Rockbridge and Botetourt Counties of Virginia during the night of the 14-15th did much damage to secondary roads and Route 11 was blocked for a number of hours with rocks and debris washed from swollen Whistle Creek. On the 25th Little Calfpasture Creek flooded its banks and covered Route 42 at Augusta Springs with 3 feet of water. Several homes on either side of the highway were flooded to the first-floor level.

UPPER MISSISSIPPI BASIN.—Severe flash floods developed from excessive rains on July 20-21 on the Kickapoo River in Wisconsin and the Root, Zumbro, Whitewater and Cannon Rivers in Minnesota and to some extent on the upper Iowa River in northeastern Iowa. The greatest property and crop damage occurred in the Kickapoo Valley and was the most severe flood in the memory of the oldest inhabitants. The town hardest hit in this valley was Soldiers Grove, Wis., where a veritable wall of water swept through the city. The volume of flood at this point was so great that it by-passed the normal bend in the river and rushed through the business and residential section of the town. The other places in the Kickapoo Valley suffering property damage were La Farge, Viola, Reedstown, Gays Mills, Barnum and Steuben, Wis. In the Zumbro River Valley, Rochester, Minn., was subjected to a maximum flood. In the Root River the major damage was to crops, in fact, crop damage was enormous in extreme southeastern Minnesota and southwestern Wisconsin. Agricultural damage was considerable even outside of the flood plain of the various streams and tributaries affected. Red Cross aid for the homeless was required in Soldiers Grove. About 400 people were stranded in the upper stories of their dwellings at Soldiers Grove. At the peak of the flood as much as 7 feet of water covered the streets in the business and residential sections. An example of the suddenness of the flood is shown at Springville, Wis., (near Viroqua) where a family of six were drowned. Their home was swept away and demolished in the early morning hours when they were sleeping. Their dwelling was built in a dry run where normally no water flows. The bodies were recovered two to six miles downstream after several days of searching. The flood resulted from excessive rainfall that occurred in connection with a frontal thunderstorm which lasted for a period of 5½ to 6 hours. There was a double focal point of heavy rainfall - one at Viroqua, Wis., with 8.3 inches and the other at Caledonia, Minn., with 6.6 inches. It may be of some significance that these two focal points were in the highest elevations of the flash flood area. Another broad area of excessive rainfall covered the Zumbro-Whitewater and Cannon River Valleys averaging 4.5 inches.

Heavy rains over the week end of July 7-9 caused moderate to heavy rises over the Pecatonica, Rock, Illinois and along the main stem of the Mississippi River below Dubuque, Iowa. The rainfall during this 48-hour period averaged more than 3 inches over the basin between Dubuque and Muscatine, Iowa. Storm totals ranged to more than 6 inches at Delaware, Iowa, on the Maquoketa River and at Sterling, Ill., on the Rock. A little more than 7 inches fell at Darlington, Wis., on the Pecatonica. The rises were in the nature of numerous local freshets. Consequently, they subsided very rapidly following occurrence of crests. The extreme sensitivity of the streams were largely due to the nearly saturated state of the soil which had prevailed all season, and to the extremely rapid rates of rainfall. The flooding along the Pecatonica in the Darlington, Wis., area was fairly severe.

Many areas in the lower Rock River Valley were inundated with extensive flooding of pastures, corn and small grain fields. Hundreds of acres of corn and some other crops were washed out. Losses were primarily in damage to crops and soils, since the crest was of brief duration and barely exceeded the level at which property damage begins. There was much difficulty and inconvenience in transportation, due to water covered roads. There was considerable damage to boats, docks and other shore equipment by trees carried in the streams.

Fairly heavy rains fell in the Raccoon and lower Des Moines River Basins on the 3d and 4th, and produced minor overflows at Van Meter, Tracy and Ottumwa, Iowa, through the 7th. The Iowa River at Wapello, Iowa, crested slightly above flood stage on July 4 due to last month's rise in the upper Cedar.

Flooding along the main stem of the Mississippi between Gordons Ferry, Iowa, and Gregory Landing, Mo., was minor. The recession that followed was interrupted by another slight flood rise due to severe local rains during the night of July 22-23 in northern Missouri.

MISSOURI BASIN.—Heavy rains on July 2 over the drainage basin of the North Fork caused flooding in the vicinity of Pierce, Nebr., and southward to near Norfolk, Nebr. Rainfall reporting stations in the area above Pierce showed that an average fall of 2.5 inches occurred on July 2. Unofficial reports from farmers north and northeast of Pierce indicated local rainfall amounts up to 3.5 inches on July 2-3.

The North Fork rose rapidly during the night of the 2d and 3d and reached flood stage at the Pierce, Nebr., gage early in the morning of July 3 and continued above flood stage until the evening of July 5. Highest reading observed at Pierce was 13.5 feet on the 3d. The flooded area extended from just north of Pierce, Nebr., southward to a point about 4 miles north of the city limits of Norfolk, and consisted of farm and pasture lands along the North Fork.

Showers and thunderstorms caused the Big Sioux River to rise above flood stage in the vicinity of Hawarden and Akron, Iowa, on June 26 and continued above flood stage from Akron to the mouth of the river until July 6. These thunderstorms were scattered, producing 2 to 3 inches of rain over wet soil and much of the rainfall passed into the tributaries and the main stem of the Big Sioux.

The Floyd River reached the highest stage (20 feet) that has been recorded at James, Iowa, since this station was established in December 1934. Heavy flooding continued along the entire length of the Floyd River from the 3d until the 7th. This heavy flooding was due to heavy thundershowers between 6 p.m. of the 2d and 6 a.m. of the 3d. The heaviest rainfall occurred over the upper portions of the Floyd River Valley, principally in Sioux and O'Brien Counties. For the most part, the rainfall varied from 2 to 2.5 inches; however, some unofficial reports indicated 3 to 5 inches in the vicinity of Hospers, Iowa. The antecedent conditions were favorable for heavy runoff as the rainfall during June averaged about twice normal. Corn and soy bean crops on the lowland was damaged severely and much of it was lost. The total losses have been estimated at $65,000.

OHIO BASIN.--On July 5, a cloudburst sent flash floods roaring down narrow valleys on small streams along the Allegheny and Ohio Rivers in Burgettstown and Smith Townships in Pennsylvania causing damages estimated at nearly 1/4 million dollars. The storm belt extended roughly from Moon Township, south of the Ohio River near Coraopolis, Pa., to Sharpsburg, Pa., on the Allegheny River. The rainfall ranged from 2 to 4 inches in this narrow belt.

Heavy rains on the 9th caused flooding on the White and Wabash Rivers between the 10th and 16th. The precipitation averaged about 3.5 inches over most of the upper Wabash above Terre Haute, a little less than 2 inches over the West Fork and slightly less than one inch over the East Fork of the White River. As a result of these rains, the Wabash rose to as much as 3 feet, or a little more, above flood stage from Terre Haute upstream to Lafayette, Ind Some flooding of fields of soy beans and corn occurred with losses estimated at several thousand dollars. The West Fork of the White River also rose to a little above flood stage at Edwardsport, but no damage occurred in that area.

WHITE AND RED BASINS.--Moderate to heavy showers between June 29 and July 3 caused flooding on the Ouachita, lower Black and White Rivers between July 5 and August 2. Flooding along the Little River was due to heavy thundershowers on July 1 and 2. Flood damage on the Black River in the vicinity of Black Rock totalled $43,000. A flash flood on De Roche Creek on July 3 did extensive damage to the village of Lambert in Hot Spring County, Arkansas. Ten houses were washed from their foundations and were either overturned or extensively damaged. Two persons were drowned in a flash flood on Harding Drain in Pine Bluff, Ark., on July 3. Flood damage on the Ouachita and White Rivers was slight.

LOWER MISSISSIPPI.--Heavy rains on June 29, 30 and July 1 over the St. Francis River Basin caused a heavy rise in the river to above flood stage at St. Francis, Ark. Moderate to heavy rains on the 10th, 13th and 14th caused additional light flooding at St. Francis and also some flooding at Fisk, Mo. Levees in the vicinity of Fisk are close to the river and they prevented any material damage, although the crest was 2.4 feet above flood stage. Damage at St. Francis was negligible as the river went only 0.4 foot above flood stage on the 1st and 0.1 foot later on in the month.

ATCHAFALAYA BASIN.--Heavy rains over the lower Missouri, Ouachita and Arkansas Basins caused the Atchafalaya River to rise to within 0.2 foot of flood stage at Morgan City, La., and 1.8 feet above flood stage at Atchafalaya, La. No damage resulted from the flooding.

COLORADO BASIN.--Flash floods caused by heavy thunderstorms in the Phoenix and Deer Valley area resulted in some temporary high water in the lower reaches of the Agua Fria and Hasayampa Rivers in Arizona. Some minor flooding was reported from Avondale and Arlington, Ariz., also in some lowland dwellings near Litchfield Park. Heavy thunderstorms occurred late on July 27, with flash floods in the lower river areas during the morning hours of the 28th.

FLOOD STAGE DATA

(All dates in July unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
ST. LAWRENCE DRAINAGE	Ft.			Ft.	
St. Joseph: Montpelier, Ohio	10	10	14	14.5	11
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Zumbro: Theilman, Minn.	11	21	23	16.5	22
Whitewater: Beaver, Minn.	7	21	22	10.6	21
Trempealeau: Dodge, Wis.	--	10	11	7.7	10
Root: Houston, Minn.	15	21	21	15.4	21
Upper Iowa: Dorchester, Iowa	--	21	21	11.1	21
Kickapoo:					
La Farge, Wis.	12	20	21	12.3	21
Steuben, Wis.	8	22	26	13.7	22
Pecatonica: Freeport, Ill.	12	9	16	14.6	12-13
Rock: Moline, Ill.	10	10	20	13.4	12, 13
Iowa:					
Marshalltown, Iowa	13	1 3	2 4	13.6 14.0	1 4
Wapello, Iowa	10	3	5	11.1	[illegible]
Raccoon:					
Van Meter, Iowa	13	3	4	14.7	[illegible]
Des Moines, Iowa (SW 18th St.)	11.5	4	4	12.0	[illegible]
Des Moines:					
Des Moines, Iowa (Scott St.)	13	4	5	13.3	4
Tracy, Iowa	14	3	8	17.0	3
Eddyville, Iowa	15	3	10	20.0	4
Ottumwa, Iowa	9	3	10	13.2	4
Illinois:					
Morris, Ill.	13	9	13	14.8	11
La Salle, Ill.	20	9	19	25.4	11
Peoria, Ill.	18	13	20	19.6	14-15
Havana, Ill.	14	11	••	16.7 16.8	17 24
Beardstown, Ill.	14	1	••	16.0 19.2	5 24
Bourbeuse: Union, Mo.	15	15	16	19.8	16
Meramec:					
Steelville, Mo.	12	11 14	11 14	13.2 21.4	11 14
Sullivan, Mo.	11	11	16	19.5	14
Pacific, Mo.	11	2 12	4 18	16.2 22.3	3 16
Valley Park, Mo.	14	2 12	4 25	16.2 25.5 15.6	[illegible] 16 22
Mississippi:					
Gordons Ferry, Iowa	13	9	11	14.4	9
Muscatine, Iowa	15	11	15	16.3	13
Keithsburg, Ill.	12	10	18	13.9	13
Burlington, Iowa	15	13	15	15.3	14
Gregory Landing, Mo.	12	5	24	15.4 13.5	14 23
Quincy, Ill.	17	15	15	17.2	15
Hannibal, Mo.	16	13	19	17.4	16
Louisiana, Mo.	15	14	19	15.8	16
Grafton, Ill.	18	June 30	30	27.5	21
St. Louis, Mo.	30	June 28	30	35.6 40.3	9 22
Chester, Ill.	27	June 27	••	39.3	23
Cape Girardeau, Mo.	32	June 28	Aug. 2	41.8	24
Ohio: Cairo, Ill.	40	18	29	40.4 40.6	21 28
Missouri Basin					
Big Sioux: Akron, Iowa	12	June 26	6	16.1 15.5	1 4
Floyd:					
Merrill, Iowa	12	4	6	14.3	[illegible]
James, Iowa	16	4	7	20.0	5
North Fork: Pierce, Nebr.	12	3	5	13.5	3
Nemaha: Falls City, Nebr.	20	6 11	6 11	27.0 25.6	6 11
Nodaway: Clarinda, Iowa	14	3	3	17.3	3
MISSISSIPPI SYSTEM (Cont.) Missouri Basin (Cont.)	Ft.			Ft.	
One Hundred Two: Maryville, Mo.	14	6	6	16.3	6
Platte: Agency, Mo.	20	7	9	23.0	7
Saline:					
Wilson, Kans.	12	11	13	21.1	11
Tescott, Kans.	25	11	18	30.2	13
Solomon:					
Alton, Kans.	12	11	13	27.0	12
Kirwin, Kans.	13	11	13	20.5	11
Beloit, Kans.	20	11 22 30	20 27 31	39.3 26.0 22.2	13 25 30
Mineapolis, Kans.	26	11 27	20 28	33.4 33.9 34.1 27.2	11 12 13 27
Niles, Kans.	24	11 28	24 30	32.0 26.8	14 29
Smoky Hill:					
Lindsborg, Kans.	21	11	19	29.3	12
Salina, Kans.	20	1 11	1 21	20.0 24.1	1 13
Abilene, Kans.	22	11	22	29.0 29.4	12-13 14
Enterprise, Kans.	26	10	23	33.9	12-13, 14
Prairie Dog Creek: Norton, Kans.	17	12	14	24.2	12
Republican:					
Cambridge, Nebr.	6	11 13 18 23	11 13 18 23	6.1 6.0 7.0 6.6	11 13 18 23
Stamford, Nebr.	14	13 16	14 19	14.1 17.9	13 19
Guide Rock, Nebr.	10	11 15	12 15	10.7 11.3 10.1	11 12 15
Hardy, Nebr.	11	11	13	12.3 12.1	11 12
Scandia, Kans.	10	11	13	11.6 11.3	11 13
Concordia, Kans.	10	11 12	11 14	11.0 11.3 11.5	11 12 13
Clay Center, Kans.	15	10 19	17 19	22.4 15.3	12 19
Wakefield, Kans.	11	10	15	16.0	12
Junction City, Kans.	10	10	17	18.6	12
Little Blue:					
Endicott, Nebr.	9	11	16	15.4	12
Hanover, Kans.	14	10	15	22.3	12
Big Blue:					
Beatrice, Nebr.	16	6 11	7 12	18.5 17.7	7 12
Barnston, Nebr.	18	6 11 18	7 13 18	24.5 24.5 24.2 20.9	7 12 12 18
Marysville, Kans.	35	7 11	8 13	36.9 38.1 39.4	7 11 12
Blue Rapids, Kans.	20	7 10 19 22	8 15 19 22	22.4 32.6 35.6 20.6 20.8	8 11 13 19 22
Randolph, Kans.	22	10	15	29.1	13
Soldier Creek: Topeka, Kans.	25	11	14	29.4	12
Delaware: Valley Falls, Kans.	22	6 11	7 12	23.0 25.4	7 12
Wakarusa: Lawrence, Kans.	23	11	--	31.5	12
Stranger Creek: Tonganoxie, Kans.	23	5 11	[illegible] 15	25.8 32.5	8 12
Kansas:					
Ogden, Kans.	18	10	18	30.5	12
Manhattan, Kans.	17	10	24	33.5 29.8	13 15
Wamego, Kans.	16	10	20	27.7	13

FLOOD STAGE DATA

(All dates in July unless otherwise specified)

Table 5-Continued

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM (Cont.)	*Ft.*			*Ft.*	
Missouri Basin (Cont.)					
Kansas: (Cont.)					
Topeka, Kans.	21	5	5	21.0	5
		10	20	36.4	13
Lecompton, Kans.	17	6	7	18.4	7
		11	20	30.2	13
Lawrence, Kans.	18	6	7	18.7	6
				19.0	7
				30.4	13
Bonner Springs, Kans.	21	11	19	38.9	13
Blue: Kansas City, Mo.	21	6	6	22.6	6
(Bannister Rd.)		11	13	38.1	11
				33.3	12
Grand:					
Pattonsburg, Mo.	20	6	8	31.0	7
Gallatin, Mo.	20	6	8	27.5	7
Chillicothe, Mo.	18	6	10	28.9	7
		12	12	19.1	12
		23	23	19.5	23
Sumner, Mo.	25	6	13	31.8	9
		23	23	25.5	23
Brunswick, Mo.	12	June 21	27	23.7	1
				22.9	10
				26.1	17
Chariton:					
Novinger, Mo.	20	22	24	24.2	23
Keytesville, Mo.	20	27	29	21.8	28
Blackwater: Blue Lick, Mo.	25	June 25	19	35.1	14
Lamine: Clifton City, Mo.	15	4	8	22.0	4
				28.9	7
		11	13	24.4	13
Pottawatomie Creek: Garnett, Kans.	26	10	12	32.3	11
Marais des Cygnes:					
Quenemo, Kans.	30	7	8	32.3	8
		10	15	41.1	11
Ottawa, Kans.	24	10	16	42.1	12
Osawatomie, Kans.	28	10	18	50.3	12
				37.3	17
La Cygne, Kans.	25	6	7	25.9	7
		10	20	36.2	13
Trading Post, Kans.	24	June 25	21	30.3	1
				28.2	4
				38.1	14
Osage:					
Osceola, Mo.	22	June 30	27	31.0	3
				35.9	6
				31.7	10
				35.1	19
Warsaw, Mo.	31	June 25	28	37.8	4
				40.1	7
				38.8	12
				38.2	20
Lakeside, Mo.	60	June 26	31	64.4	7
St. Thomas, Mo.	23	June 29	28	35.0	9, 14
Gasconade:					
Hazelgreen, Mo.	21	1	1	23.0	1
Jerome, Mo.	15	June 30	3	20.0	2
Missouri:					
Nebraska City, Nebr.	15	3	3	17.4	3
		5	6	15.3	6
St. Joseph, Mo.	17	4	4	17.4	4
		6	8	19.2	7
Kansas City, Mo.	22	4	9	25.9	8
		11	20	36.0	14
Lexington, Mo.	22	June 21	22	27.1	1
				28.0	7
				33.3	15
Waverly, Mo.	18	June 21	26	27.3	8
				28.2	14
Boonville, Mo.	21	June 22	26	28.4	10
				32.8	17
Jefferson City, Mo.	23	June 24	26	29.4	4
				30.2	12
				34.2	18
Hermann, Mo.	21	June 23	29	31.3	4
				31.2	13
				33.0	19
St. Charles, Mo.	25	June 23	30	36.4	5
				36.2	14
				37.3	20
Ohio Basin					
West Fork: Edwardsport, Ind.	12	1	2	13.6	1
		13	14	12.7	14

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM (Cont.)	*Ft.*			*Ft.*	
Ohio Basin (Cont.)					
Wabash:					
Lafayette, Ind.	11	10	12	14.0	10
Covington, Ind.	16	10	14	18.7	12
Montezuma, Ind.	--	—	--	20.5	12
Terre Haute, Ind.	14	10	16	17.2	12-13
Hutsonville, Ind.	--	—	—	20.2	15-16
Riverton, Ind.	--	—	--	17.5	16-17
White Basin					
Black: Black Rock, Ark.	14	5	25	19.5	12
White:					
Clarendon, Ark.	26	16	30	26.5	25
St. Charles, Ark.	25	23	Aug. 2	25.2	27
Arkansas Basin					
Cow Creek: Lyons, Kans.	18	13	14	18.8	14
Little Arkansas:					
Sedgwick, Kans.	18	1	4	22.7	3
		12	17	23.9	13
Ripley, Kans.	12	13	16	15.4	13
Walnut:					
Augusta, Kans.	23	June 30	1	28.6	1
		4	4	27.0	4
		12	12	25.1	12
Winfield, Kans.	30	June 30	2	38.3	1
Chikaskia: Blackwell, Okla.	16	1	2	22.6	1
		13	16	26.0	15
Cimarron: Perkins, Okla.	11	1	2	11.4	2
Caney: Bartlesville, Okla.	29	1	4	34.5	2
Verdigris:					
Independence, Kans.	30	1	6	46.6	1
		10	17	34.4	11
				44.4	13
Coffeyville, Kans.	20	1	6	25.4	2
		13	17	23.7	14
Cottonwood:					
Cottonwood Falls, Kans.	9	June 29	2	16.4	June 30
		10	15	14.0	10
				19.8	11
				18.8	12
Emporia, Kans.	20	June 30	6	21.0	6
		10	17	33.3	11
				32.6	12
Neosho:					
Council Grove, Kans.	34.5	11	12	36.5	11
				36.0	12
Emporia, Kans.	22	10	14	29.4	11
				29.0	12
		16	16	23.8	16
Neosho Rapids, Kans.	22	1	4	27.6	1
		10	17	34.3	11
				31.7	13
Burlington, Kans.	27	1	5	34.5	2
		7	7	28.6	7
		11	18	41.5	12
		23	24	28.0	24
Le Roy, Kans.	23	June 30	8	27.6	3
				24.6	7
		10	18	34.5	12
		24	24	23.3	24
Iola, Kans.	15	1	19	21.2	4
				33.4	13
Chanute, Kans.	20	1	20	26.2	2
				28.1	5
				38.6	13
Erie, Kans.	20	1	20	27.5	5
				26.0	7
				25.6	11
Parsons, Kans.	24	1	23	40.2	14
Oswego, Kans.	17	1	24	22.4	2
				22.9	6
				24.3	12
				32.5	15
Arkansas:					
Great Bend, Kans.	8	1	4	10.8	2
		12	17	11.2	13
Hutchinson, Kans.	6	1	7	8.6	5
		13	18	10.1	16
Wichita, Kans.	9	1	8	13.4	1
		13	19	12.7	17
Oxford, Kans.	14	1	2	14.3	1

FLOOD STAGE DATA

(All dates in July unless otherwise specified)

Table 5-Continued

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM (Cont.) Arkansas Basin (Cont.)	*Ft.*			*Ft.*	
Arkansas: (Cont.) Arkansas City, Kans.	16	1 14	6 20	21.1 18.6	2 15
Ralston, Okla.	16	1 14	6 18	22.1 21.0	3 17
Tulsa, Okla.	16	4	4	16.2	4
Webbers Falls, Okla.	23	1	25	29.0 28.5	5 18
Fort Smith, Ark.	22	2 13	11 26	25.8 22.8 25.9	6 15 19
Van Buren, Ark.	22	2	27	27.1 24.0 27.2	6 15 19
Ozark, Ark.	22	5 19	8 21	22.8 22.8	6 20
Red Basin					
Ouachita: Arkadelphia, Ark.	17	3	6	26.0	3
Camden, Ark.	26	6	11	32.0	9
Little: Whitecliffs, Ark.	25	3	9	27.9	5
Lower Mississippi Basin					
St. Francis: Fisk, Mo.	20	14	19	22.4	17
St. Francis, Ark.	18	1 21	2 24	18.4 18.1	1 22,24
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La.	25	9	Aug. 10	26.8	28-Aug. 2

* Provisional.

** Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

JULY 1951

Standard pressure surface (mb.)	ALBANY, N. Y. (1004 MB.)				ALBUQUERQUE, N. MEX. (838 MB.)				ATLANTA, GA. (982 MB.)				BIG SPRING, TEX. (924 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (911 MB.)				BROWNSVILLE, TEX. (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	86	20.1	80	31	1,620	28.6	28	30	307	25.1	74	31	784	29.1	43	31	505	21.0	71	31	868	28.1	29	31	6	27.4	81
1,000	31	122			31	10			30	146			31	71			31	98			31	29			31	118	26.6	80
950	31	573	19.8	68	31	485			30	603	25.0	67	31	537			28	550	21.9	65	31	497			31	575	23.9	75
900	31	1,031	16.9	70	31	979			30	1,074	22.4	67	31	1,020	29.0	40	31	1,016	20.3	52	31	973	29.0	21	31	1,043	22.2	60
850	31	1,517	13.7	72	31	1,491			30	1,569	18.8	70	31	1,526	25.2	44	31	1,507	17.1	52	31	1,477	25.1	21	31	1,539	19.9	51
800	31	2,026	10.5	71	31	2,029	26.3	27	30	2,087	15.4	67	31	2,056	21.0	51	31	2,020	13.5	54	31	2,004	20.8	24	31	2,059	17.1	48
750	31	2,568	7.5	63	31	2,597	21.7	31	30	2,639	12.2	62	31	2,614	16.7	53	31	2,568	9.8	53	31	2,562	16.1	27	31	2,610	13.9	48
700	31	3,127	4.8	55	31	3,187	16.5	37	29	3,208	8.9	60	31	3,195	12.6	54	31	3,130	6.2	52	31	3,138	11.2	31	31	3,186	10.5	49
650	31	3,729	1.9	48	31	3,817	11.0	46	27	3,823	5.2	58	31	3,815	8.6	49	31	3,741	2.5	46	31	3,754	6.2	38	31	3,804	6.8	49
600	31	4,370	- 1.8	45	31	4,473	5.4	54	27	4,466	1.3	55	31	4,470	4.3	47	31	4,376	- 1.4	39	31	4,402	1.1	39	31	4,454	2.9	45
550	31	5,059	- 5.8	45	30	5,182	- 0.3	62	25	5,170	- 2.5	46	31	5,173	- 0.3	42	31	5,069	- 6.0	38	30	5,096	- 3.9	40	31	5,158	- 1.3	39
500	30	5,801	-10.0	40	30	5,933	- 6.1	67	26	5,913	- 6.5	39	29	5,930	- 4.7	33	31	5,803	-11.0	41	29	5,838	- 9.2	37	31	5,907	- 5.6	36
450	30	6,613	-15.0	40	30	6,762	-11.3	62	25	6,739	-11.2	41	29	6,752	- 9.9		31	6,612	-16.4	37	29	6,651	-14.6		31	6,736	-10.7	32
400	30	7,486	-21.1	41	30	7,646	-16.7	45	25	7,623	-17.1	39	28	7,653	-15.8		31	7,480	-23.0	35	29	7,527	-20.5		31	7,622	-17.0	34
350	29	8,459	-28.0		30	8,636	-23.4	33	23	8,610	-24.0		28	8,644	-23.0		31	8,443	-30.1	33	29	8,501	-27.6		29	8,609	-24.0	31
300	30	9,549	-35.9		29	9,745	-31.8		23	9,717	-32.0		28	9,755	-31.6		31	9,522	-38.2		28	9,588	-36.1		29	9,716	-32.4	
250	30	10,790	-45.1		29	11,007	-42.1		22	10,981	-41.8		26	11,018	-41.6		30	10,757	-46.8		28	10,829	-45.0		29	10,975	-42.3	
200	30	12,249	-54.0		29	12,479	-54.1		22	12,455	-53.4		24	12,495	-53.4		30	12,213	-53.1		27	12,297	-52.5		28	12,445	-54.1	
175	30	13,099	-56.7		28	13,321	-60.5		22	13,302	-59.5		24	13,340	-60.0		29	13,069	-55.6		27	13,153	-55.7		28	13,289	-60.4	
150	30	14,069	-59.6		27	14,265	-66.7		22	14,252	-65.6		23	14,287	-66.5		29	14,044	-58.5		27	14,126	-59.2		26	14,234	-66.3	
125	28	15,218	-61.3		27	15,351	-72.0		21	15,344	-70.0		21	15,366	-72.4		28	15,182	-60.4		26	15,266	-62.0		26	15,323	-71.4	
100	26	16,605	-62.3		25	16,663	-72.9		19	16,677	-68.8		19	16,675	-72.3		26	16,575	-60.4		22	16,662	-62.4		26	16,634	-72.3	
80	24	17,993	-59.6		21	17,995	-66.5		17	18,020	-64.9		17	18,001	-67.4		22	17,975	-58.0		16	18,061	-59.6		25	17,957	-68.4	
60	20	19,811	-56.3		15	19,765	-60.2		15	19,788	-60.7		13	19,768	-60.4		15	19,790	-55.4		11	19,865	-55.2		16	19,716	-62.4	
50	11	20,979	-55.2		9	20,896	-57.9		9	20,927	-58.7		6	20,906	-58.4						6	21,036	-52.6		10	20,853	-59.1	
40	6	22,412	-52.8																									

	BUFFALO, N. Y. (990 MB.)				BURRWOOD, LA. (1016 MB.)				CAMAGUEY, CUBA (1002 MB.)				CARIBOU, MAINE (990 MB.)				CHARLESTON, S. C. (1016 MB.)				CIUDAD VICTORIA, MEX. (972 MB.)				COLUMBIA, MO. (987 MB.)			
SURFACE	31	221	19.5	76	31	3	27.2	82	30	122	24.0	93	31	191	15.8	83	31	13	24.2	88	30	335	31.3	47	31	239	23.5	84
1,000	31	132			31	143	26.7	79	30	143	24.1	92	31	105			31	152	25.5	80	30	79			31	124		
950	31	580	20.0	62	31	600	24.0	77	30	601	23.2	81	31	547	16.9	66	31	608	23.8	68	30	544	29.6	49	31	579	23.6	72
900	31	1,042	17.4	63	31	1,067	21.4	72	30	1,065	21.3	74	31	1,004	14.7	66	31	1,077	21.3	67	30	1,022	25.5	55	31	1,047	20.9	74
850	31	1,528	14.1	64	31	1,561	18.5	66	30	1,559	18.5	69	31	1,485	11.4	68	31	1,570	18.0	68	30	1,522	21.5	60	31	1,540	18.6	63
800	31	2,037	10.8	63	31	2,079	15.4	66	30	2,078	15.4	67	31	1,990	8.4	65	31	2,088	14.8	65	30	2,045	17.4	63	31	2,058	16.1	53
750	31	2,577	7.9	58	31	2,628	12.6	59	30	2,621	12.1	63	31	2,528	5.4	62	31	2,638	11.7	60	30	2,595	13.4	64	31	2,610	13.0	50
700	31	3,140	5.0	57	31	3,201	9.4	58	30	3,199	8.6	59	31	3,081	2.3	56	31	3,207	8.5	58	30	3,172	9.9	61	31	3,182	9.9	49
650	31	3,745	1.8	54	30	3,816	6.0	56	29	3,811	5.0	55	31	3,681	- 0.8	52	31	3,821	4.8	61	29	3,791	6.7	50	31	3,799	6.3	43
600	31	4,383	- 1.7	49	31	4,465	2.6	48	30	4,458	1.2	55	31	4,313	- 4.1	47	31	4,465	1.3	57	29	4,439	2.7	49	31	4,446	2.3	42
550	31	5,073	- 5.6	44	31	5,167	- 1.6	46	29	5,157	- 2.9	57	31	4,999	- 8.1	42	31	5,164	- 2.5	51	29	5,143	- 1.2	49	30	5,147	- 2.0	36
500	31	5,811	-10.2	42	31	5,916	- 6.1	39	29	5,903	- 7.3	57	31	5,729	-12.6	39	31	5,912	- 6.6	45	28	5,893	- 5.4	42	30	5,896	- 6.5	
450	31	6,617	-15.2	43	31	6,742	-10.9	34	28	6,723	-12.0	54	31	6,531	-18.0	36	31	6,738	-11.6	44	28	6,723	-10.3	40	30	6,718	-12.1	
400	31	7,495	-21.4	43	31	7,630	-17.0	29	28	7,612	-17.6	49	31	7,395	-24.3	36	31	7,621	-17.6	46	28	7,613	-16.0	37	30	7,603	-18.1	
350	31	8,467	-28.1	39	31	8,617	-24.2		28	8,598	-24.5	44	30	8,358	-31.1	38	30	8,607	-24.5	46	26	8,606	-23.2	35	30	8,587	-25.0	
300	31	9,557	-35.7	37	30	9,718	-33.0		28	9,704	-32.7	41	30	9,432	-39.2		31	9,710	-32.9	48	24	9,718	-31.7		30	9,688	-33.3	
250	31	10,801	-44.4		30	10,975	-42.9		27	10,964	-42.6		30	10,660	-47.4		31	10,967	-42.7		24	10,983	-41.3		30	10,941	-43.1	
200	31	12,268	-52.5		30	12,440	-54.9		28	12,435	-54.8		29	12,113	-53.5		31	12,435	-54.4		22	12,462	-53.2		30	12,409	-54.0	
175	30	13,121	-55.3		30	13,280	-61.2		28	13,276	-61.2		29	12,970	-54.1		31	13,277	-60.5		22	13,309	-59.6		30	13,255	-59.2	
150	27	14,101	-58.4		30	14,223	-66.9		27	14,221	-67.0		28	13,957	-55.3		31	14,224	-65.7		21	14,258	-65.9		30	14,207	-64.9	
125	25	15,238	-60.4		30	15,311	-71.0		27	15,311	-70.5		25	15,116	-56.2		31	15,319	-69.3		19	15,351	-71.0		30	15,307	-68.9	
100	24	16,621	-59.9		28	16,631	-70.5		24	16,637	-70.8		20	16,517	-55.8		27	16,653	-68.3		16	16,662	-71.7		29	16,643	-67.5	
80	20	18,023	-57.8		26	17,968	-65.9		18	17,962	-69.4		11	17,944	-55.1		21	18,007	-64.2		14	17,984	-68.6		24	17,999	-63.0	
60	9	19,847	-54.7		15	19,731	-61.5		11	19,695	-63.2		5	19,792	-53.5		14	19,784	-60.6		11	19,723	-62.5		22	19,788	-58.6	
50					7	20,875	-60.1		7	20,810	-60.6						5	20,970	-58.7		5	20,865	-59.3		21	20,937	-56.3	
40									5	22,221	-56.7														12	22,354	-54.3	

	DODGE CITY, KANS. (924 MB.)				EL PASO, TEX. (879 MB.)				ELY, NEV. (810 MB.)				GLASGOW, MONT. (938 MB.)				GRAND JUNCTION, COLO. (850 MB.)				GREAT FALLS, MONT. (887 MB.)				GREENSBORO, N. C. (986 MB.)			
SURFACE	30	792	24.6	69	31	1,195	30.7	33	31	1,908	23.2	34	31	648	24.2	44	31	1,474	27.3	25	31	1,128	21.2	47	31	273	22.4	86
1,000	30	87			31	24			31	22			31	76			31	9			31	72			31	149		
950	30	544			31	500			31	491			31	535			31	479			31	525			31	600	23.9	64
900	30	1,022	24.6	64	31	989			31	975			31	1,006	23.0	37	31	966			31	999			31	1,072	21.4	64
850	30	1,522	22.3	62	31	1,499	29.4	31	31	1,480			31	1,500	19.1	40	31	1,476			31	1,496	19.9	41	31	1,565	17.9	69
800	30	2,048	19.7	58	31	2,034	25.0	34	31	2,014	23.9	31	31	2,018	15.0	45	31	2,013	26.1		31	2,015	16.4	41	31	2,082	14.4	70
750	30	2,605	16.5	53	31	2,601	20.3	40	31	2,578	20.0	31	31	2,566	10.6	51	31	2,577	21.3	23	31	2,562	12.3	44	31	2,624	11.2	65
700	30	3,186	12.6	51	31	3,187	15.3	48	31	3,164	15.1	35	31	3,131	6.4	51	31	3,167	16.1	28	31	3,134	7.7	50	31	3,200	8.2	60
650	30	3,806	8.3	49	31	3,810	9.9	57	31	3,788	9.9	41	31	3,741	2.1	48	31	3,794	10.5	36	31	3,745	3.0	53	31	3,812	5.0	58
600	30	4,460	3.8	47	30	4,467	4.6	64	31	4,444	4.5	47	31	4,376	- 1.9	39	31	4,451	4.7	45	31	4,383	- 1.4	47	31	4,459	1.6	53
550	30	5,164	- 0.9	44	30	5,176	- 0.6	62	31	5,148	- 1.3	54	31	5,066	- 6.6	37	31	5,156	- 1.2	51	31	5,071	- 6.3	41	29	5,156	- 2.1	46
500	30	5,915	- 5.9	42	30	5,926	- 5.3	53	31	5,899	- 7.0	53	31	5,799	-11.5	35	31	5,906	- 6.9	52	31	5,809	-11.5	38	30	5,907	- 6.7	44
450	29	6,734	-11.0	35	29	6,754	-10.4	46	31	6,716	-12.0	40	31	6,609	-16.9		31	6,727	-12.4	46	30	6,613	-17.3	35	30	6,732	-11.7	40
400	29	7,626	-16.9	32	29	7,644	-15.8	34	31	7,605	-18.3		31	7,473	-23.1		31	7,611	-18.2	36	30	7,480	-23.6		30	7,617	-17.4	42
350	29	8,614	-24.1		29	8,636	-22.9		31	8,588	-25.1		31	8,437	-30.3		31	8,594	-25.2		30	8,441	-30.7	34	30	8,604	-24.2	39
300	29	9,719	-32.3	37	29	9,746	-31.3		31	9,689	-33.1		31	9,515	-38.5		31	9,695	-33.4		30	9,517	-38.8		30	9,709	-32.3	40
250	29	10,980	-41.7		29	11,012	-41.0		31	10,947	-41.8		31	10,744	-46.9		31	10,950	-42.8		30	10,744	-47.5		30	10,971	-41.8	
200	29	12,454	-53.4		29	12,490	-53.1		31	12,426	-52.2		31	12,200	-52.1		31	12,419	-53.6		30	12,198	-52.8		30	12,445	-53.3	
175	28	13,300	-59.4		27	13,336	-59.8		31	13,279	-57.2		31	13,061	-53.7		31	13,267	-58.8		30	13,054	-54.7		30	13,293	-58.9	
150	28	14,250	-65.5		26	14,279	-66.8		29	14,239	-61.9		30	14,054	-56.1		31	14,221	-64.1		29	14,037	-57.0		30	14,248	-63.9	
125	26	15,349	-70.9		26	15,362	-73.0		29	15,356	-65.4		28	15,213	-58.6		30	15,324	-68.7		27	15,190	-59.1		29	15,351	-67.5	
100	25	16,666	-70.6		25	16,664	-73.6		29	16,708	-66.0		26	16,616	-58.6		25	16,647	-69.5		24	16,584	-58.9		25	16,693	-66.8	
80	24	18,000	-65.7		24	17,995	-66.5		24	18,071	-61.7		24	18,020	-56.7		25	17,995	-63.1		22	17,985	-57.6		23	18,053	-62.8	
60	20	19,787	-59.1		21	19,765	-60.2		17	19,877	-56.7		19	19,853	-53.7		19	19,792	-58.5		17	19,815	-54.7		17	19,842	-58.2	
50	16	20,942	-56.3		10	20,907	-58.2		12	21,043	-54.4		14	21,034	-52.0		6	20,958	-57.3		15	21,000	-53.2		12	20,999	-56.7	
40	6	22,361	-54.0						5	22,485	-52.8		5	22,476	-49.9						10	22,447	-51.3					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

JULY 1951

Standard pressure surface (mb.)	HATTERAS, N. C. (1017 MB.)				HAVANA, CUBA (1011 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (971 MB.)				JOLIET, ILL. (995 MB.)				LAKE CHARLES, LA. (1015 MB.)				LANDER, WYO. (831 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	25.2	85	31	49	25.6	86	31	9	26.1	69	31	361	16.7	79	31	179	20.1	81	31	5	26.5	84	31	1,696	20.8	45
1,000	31	149	24.8	80	31	148	25.9	81	31	135	24.9	71	31	105			31	130			31	134	27.4	78	31	51		
950	31	603	22.2	75	31	605	23.8	76	31	589	21.1	77	30	555	19.0	64	31	580	21.2	65	31	594	25.1	75	31	515		
900	31	1,067	19.5	71	31	1,073	21.2	73	31	1,051	17.7	81	31	1,010	16.2	63	31	1,044	17.9	68	31	1,063	22.5	71	31	994		
850	31	1,557	16.7	64	31	1,566	18.2	71	31	1,538	14.7	81	31	1,494	12.9	68	31	1,532	15.1	66	31	1,559	19.6	68	31	1,493		
800	31	2,072	13.9	59	31	2,084	15.3	66	31	2,050	13.0	67	31	2,001	9.9	65	31	2,043	12.8	55	31	2,079	16.7	64	31	2,021	21.4	37
750	31	2,617	11.2	54	31	2,633	12.2	64	31	2,600	11.3	49	31	2,542	6.9	61	31	2,589	10.3	50	31	2,630	13.6	63	31	2,577	17.1	40
700	31	3,187	8.2	48	31	3,205	9.0	64	31	3,166	9.1	35	31	3,099	3.6	54	31	3,155	7.3	49	31	3,205	10.3	62	31	3,160	12.5	44
650	31	3,804	4.9	46	31	3,821	5.3	65	31	3,785	5.9	37	31	3,703	0.2	54	31	3,766	4.2	46	31	3,823	7.0	55	31	3,778	7.7	47
600	31	4,445	1.1	47	31	4,466	1.3	67	31	4,427	3.2		31	4,334	- 3.6	44	31	4,409	0.4	43	31	4,474	3.2	54	31	4,430	2.5	53
550	31	5,145	- 2.9	45	31	5,172	- 2.4	67	29	5,130	- 0.7		31	5,017	- 8.0	40	30	5,105	- 3.6	35	31	5,180	- 1.0	48	31	5,128	- 3.1	54
500	31	5,888	- 7.4	40	31	5,913	- 6.5	61	30	5,882	- 5.3		31	5,750	-12.7	37	30	5,850	- 8.3		31	5,927	- 5.8	43	31	5,875	- 8.3	49
450	31	6,710	-12.6	39	31	6,737	-11.3	57	30	6,711	-10.4		30	6,547	-18.1	36	29	6,660	-14.2		31	6,756	-10.8	41	30	6,694	-13.8	43
400	31	7,591	-18.7	40	31	7,625	-17.0	52	29	7,598	-16.9		31	7,415	-24.5	37	29	7,539	-20.4		31	7,641	-16.9	38	30	7,573	-20.1	37
350	31	8,571	-25.9	39	31	8,613	-23.8	45	29	8,585	-24.5		29	8,370	-31.9		29	8,514	-27.3		31	8,628	-23.9		30	8,548	-27.2	
300	31	9,667	-34.3	38	31	9,720	-32.2	44	29	9,689	-32.9		29	9,441	-40.1		29	9,606	-35.0		31	9,734	-32.2		30	9,640	-35.2	
250	31	10,916	-44.2		31	10,979	-42.4		29	10,947	-42.4		29	10,663	-48.0		29	10,855	-43.4		31	10,994	-42.2		30	10,886	-44.0	
200	31	12,374	-55.4		29	12,442	-54.7		29	12,417	-53.9		29	12,116	-52.8		29	12,327	-52.3		31	12,463	-54.3		30	12,354	-52.7	
175	30	13,223	-61.0		29	13,284	-61.1		29	13,262	-60.0		29	12,975	-53.2		29	13,181	-56.9		31	13,306	-60.3		30	13,207	-57.0	
150	28	14,169	-65.2		28	14,226	-67.2		29	14,210	-65.9		29	13,964	-54.7		29	14,146	-61.2		30	14,249	-66.5		28	14,170	-61.1	
125	25	15,264	-68.7		28	15,312	-71.5		29	15,301	-71.0		28	15,125	-57.0		28	15,269	-64.2		30	15,336	-71.5		23	15,290	-64.5	
100	20	16,596	-67.2		25	16,627	-71.2		29	16,612	-72.5		28	16,534	-57.0		28	16,631	-64.4		28	16,648	-72.0		21	16,644	-63.6	
80	15	17,954	-62.7		20	17,956	-68.2		27	17,934	-69.7		23	17,962	-55.8		26	18,000	-61.7		25	17,970	-67.4		17	18,011	-61.0	
60	9	19,737	-58.9		16	19,705	-62.3		27	19,669	-64.4		15	19,806	-54.1		19	19,813	-58.5		23	19,725	-62.2		15	19,817	-56.7	
50	6	20,891	-57.7		13	20,843	-58.8		26	20,793	-60.6		11	20,991	-52.3		9	20,977	-56.5		22	20,854	-59.4		9	20,991	-55.0	
40					7	22,255	-55.3		25	22,191	-56.7										9	22,244	-57.1					
30									18	24,037	-52.3																	
20									8	26,689	-48.4																	

Standard pressure surface (mb.)	LAS VEGAS, NEV. (932 MB.)				LITTLE ROCK, ARK. (1005 MB.)				MAZATLAN, MEXICO (1007 MB.)				MEDFORD, ORE. (965 MB.)				MERIDA, MEXICO (1012 MB.)				MIAMI, FLA. (1018 MB.)				NANTUCKET, MASS. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	660	34.9	19	31	79	26.0	83	29	14	28.8	75	31	401	27.3	30	31	27	26.7	78	31	4	26.0	84	31	14	18.5	91
1,000	31	12			31	128	26.4	80	29	80	28.2	76	31	88			31	129	26.2	78	31	158	26.0	80	31	131	20.5	83
950	31	484			31	586	25.6	73	29	542	24.9	75	31	546	26.3	30	31	587	24.4	72	31	607	23.3	79	31	577	19.5	67
900	31	975	33.8	20	31	1,057	22.8	72	29	1,009	23.0	74	31	1,016	22.8	34	31	1,055	21.6	74	31	1,081	20.5	77	31	1,038	16.9	67
850	31	1,488	29.7	21	31	1,553	19.9	67	29	1,507	20.4	73	31	1,510	18.8	41	31	1,549	18.6	74	31	1,574	17.7	73	31	1,524	14.2	63
800	31	2,023	25.0	24	31	2,074	17.1	59	29	2,029	17.6	70	31	2,027	14.8	45	31	2,068	15.5	71	31	2,090	14.7	70	31	2,034	11.7	54
750	31	2,587	20.0	29	31	2,626	14.1	52	29	2,586	14.6	68	30	2,575	11.1	45	31	2,613	12.6	66	31	2,635	11.7	66	31	2,578	9.2	51
700	31	3,173	14.7	35	31	3,201	10.7	49	28	3,161	11.5	68	31	3,142	7.6	42	31	3,191	9.4	63	31	3,209	8.3	66	31	3,141	6.0	48
650	31	3,795	9.4	40	31	3,821	7.2	46	27	3,783	7.8	69	31	3,753	4.0	34	31	3,804	5.7	65	30	3,819	4.8	65	31	3,750	2.6	44
600	31	4,452	4.4	43	31	4,470	3.5	44	26	4,433	3.3	72	31	4,394	0.2		31	4,453	2.0	63	28	4,470	1.2	62	31	4,388	- 1.0	45
550	31	5,158	- 0.4	39	30	5,176	- 0.4	42	26	5,136	- 1.3	73	31	5,089	- 3.9		31	5,157	- 1.8	62	28	5,169	- 2.5	56	31	5,081	- 4.9	39
500	30	5,911	- 5.6	36	30	5,927	- 4.9	37	26	5,888	- 5.7	65	31	5,831	- 9.0		30	5,905	- 6.1	59	28	5,916	- 6.8	52	31	5,821	- 9.3	34
450	30	6,737	-11.1		30	6,758	- 9.9		26	6,715	-10.4	56	30	6,641	-14.8		30	6,734	-11.0	58	27	6,737	-11.8	49	31	6,635	-14.3	
400	30	7,624	-17.2		30	7,646	-15.9	33	26	7,606	-15.9	46	30	7,517	-21.6		30	7,620	-16.5	51	28	7,624	-17.7	45	29	7,511	-20.5	
350	30	8,612	-24.3		30	8,638	-23.0		26	8,598	-22.9		29	8,486	-29.2		30	8,606	-23.7	48	26	8,610	-24.7	48	29	8,485	-27.4	
300	30	9,717	-32.4		30	9,748	-31.3		25	9,707	-31.2		28	9,566	-37.6		30	9,715	-32.3	44	26	9,713	-33.3	48	29	9,576	-35.4	
250	30	10,977	-42.0		30	11,013	-41.3		25	10,971	-41.3		28	10,799	-46.1		30	10,973	-42.7		25	10,969	-43.3		29	10,819	-44.9	
200	30	12,451	-53.3		30	12,492	-52.9		22	12,441	-54.2		28	12,258	-52.9		29	12,437	-55.6		25	12,430	-55.8		29	12,280	-54.1	
175	30	13,297	-59.4		29	13,341	-59.0		21	13,295	-60.8		27	13,107	-55.8		27	13,271	-62.6		25	13,267	-62.3		29	13,128	-58.1	
150	30	14,248	-65.6		27	14,296	-64.7		13	14,249	-66.6		26	14,084	-59.3		23	14,209	-69.3		25	14,205	-68.3		28	14,090	-61.3	
125	30	15,341	-70.5		26	15,397	-69.8		9	15,326	-73.7		26	15,217	-61.7		10	15,287	-72.8		19	15,286	-71.2		28	15,214	-63.6	
100	28	16,661	-70.4		23	16,725	-70.6						25	16,599	-62.5		6	16,580	-70.9		16	16,614	-70.7		27	16,580	-62.8	
80	27	18,003	-64.7		22	18,060	-65.8						24	17,982	-60.5		5	17,914	-69.7		16	17,943	-68.0		27	17,964	-59.4	
60	22	19,785	-58.8		18	19,827	-60.9						15	19,806	-57.5						13	19,700	-62.8		17	19,783	-56.8	
50	15	20,943	-56.4		17	20,968	-58.3						10	20,979	-55.7						8	20,852	-60.7		15	20,945	-55.6	
40	5	22,378	-56.5																									

Standard pressure surface (mb.)	NASHVILLE, TENN. (996 MB.)				NORTH PLATTE, NEBR. (918 MB.)				OAKLAND, CALIF. (1013 MB.)				OKLAHOMA CITY, OKLA. (969 MB.)				OMAHA, NEBR. (979 MB.)				PHOENIX, ARIZ. (968 MB.)				PITTSBURGH, PA. (972 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	177	24.7	81	31	849	21.2	79	31	6	15.2	76	31	391	26.3	74	31	308	23.3	73	31	338	35.8	30	31	382	21.9	69
1,000	31	139			31	93			31	116	14.0	78	31	105			31	120			31	38			31	135		
950	30	592	24.3	68	31	547			31	564	17.6	57	31	567	26.8	67	31	574	22.8	68	31	513	35.6	26	31	585	22.1	63
900	31	1,065	21.5	66	31	1,017	21.8	68	31	1,017	21.6	28	31	1,040	24.4	64	31	1,042	20.1	70	31	998	32.3	25	31	1,052	19.4	63
850	31	1,559	18.4	65	31	1,513	19.7	65	31	1,511	20.5		31	1,539	21.4	62	31	1,534	17.6	64	31	1,508	28.1	28	31	1,541	15.9	66
800	31	2,077	15.4	61	31	2,033	17.2	63	31	2,031	17.6		31	2,062	18.6	56	31	2,051	15.5	51	31	2,041	23.5	33	31	2,054	12.5	66
750	31	2,621	12.1	60	31	2,586	14.5	54	31	2,585	14.5		30	2,618	15.6	48	31	2,599	13.0	49	31	2,602	18.7	38	31	2,597	9.5	59
700	31	3,197	8.7	56	31	3,162	11.0	46	31	3,158	11.2		31	3,194	11.8	47	31	3,173	9.6	49	31	3,187	13.9	41	31	3,163	6.5	52
650	31	3,810	5.2	51	31	3,780	7.2	41	31	3,778	7.3		31	3,814	8.2	41	31	3,788	6.1	46	30	3,813	9.2	44	31	3,774	3.4	44
600	31	4,456	1.5	48	31	4,429	2.9	39	31	4,425	3.0		30	4,467	4.2	37	31	4,437	2.0	45	30	4,465	4.3	47	30	4,416	- 0.0	35
550	31	5,158	- 2.5	43	31	5,133	- 1.8	36	31	5,126	- 1.8		30	5,171	- 0.4	37	31	5,136	- 2.6	37	30	5,171	- 0.8	51	30	5,110	- 4.1	33
500	31	5,903	- 6.6	37	31	5,879	- 7.1	37	31	5,875	- 6.9		29	5,924	- 5.3	33	31	5,883	- 7.4	32	30	5,922	- 5.9	51	30	5,853	- 8.5	
450	31	6,726	-11.4	35	30	6,698	-12.7	31	31	6,697	-12.8		29	6,750	-10.6		31	6,703	-12.9		30	6,750	-10.5	43	29	6,665	-13.7	
400	31	7,612	-17.1	37	30	7,580	-19.2		31	7,577	-19.1		29	7,639	-16.7		31	7,586	-18.6		30	7,639	-15.9	33	29	7,546	-19.3	
350	31	8,599	-24.2	36	30	8,559	-26.2		30	8,557	-26.7		29	8,628	-23.8		30	8,566	-25.9		30	8,631	-23.0		29	8,525	-26.2	
300	30	9,702	-32.4		30	9,656	-34.1		30	9,651	-34.8		29	9,735	-32.0		30	9,665	-34.0		30	9,741	-31.3		29	9,620	-34.6	
250	29	10,962	-42.1		30	10,910	-43.0		30	10,901	-43.4		28	10,994	-41.8		30	10,920	-42.9		29	11,006	-41.2		28	10,868	-44.2	
200	29	12,436	-53.3		30	12,380	-53.2		30	12,370	-52.8		27	12,465	-53.6		30	12,390	-53.6		29	12,482	-53.5		28	12,333	-53.6	
175	29	13,283	-59.2		30	13,229	-58.5		30	13,222	-57.5		27	13,311	-59.6		30	13,237	-58.8		29	13,327	-60.0		28	13,181	-58.1	
150	28	14,237	-64.6		30	14,185	-64.1		30	14,184	-62.4		27	14,259	-66.0		30	14,192	-64.4		29	14,273	-66.6		27	14,148	-62.2	
125	27	15,336	-69.7		28	15,291	-68.3		30	15,297	-65.9		24	15,346	-71.3		28	15,298	-68.0		28	15,358	-72.1		27	15,266	-64.2	
100	26	16,662	-69.1		26	16,630	-67.7		28	16,644	-66.1		21	16,661	-71.3		27	16,637	-67.1		26	16,659	-72.4		24	16,634	-63.8	
80	20	18,016	-65.3		23	17,995	-63.6		27	18,007	-62.6		19	17,999	-64.9		24	17,998	-62.7		23	17,990	-66.3		23	18,013	-60.6	
60	19	19,784	-59.9		16	19,772	-58.5		21	19,806	-58.1		9	19,782	-59.7		18	19,794	-57.8		19	19,769	-59.8		21	19,818	-56.8	
50	17	20,925	-58.0		16	20,924	-56.0		18	20,960	-55.7						13	20,959	-55.4		9	20,927	-57.1		18	20,990	-54.7	
40	13	22,351	-54.8		12	22,349	-53.7		9	22,363	-52.9						8	22,387	-53.7						15	22,420	-52.4	
30	8	24,205	-52.8		5	24,202	-50.5																					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Standard pressure surface (mb)	PORTLAND, MAINE (1011 MB.)				RAPID CITY, S. DAK. (905 MB.)				ST. CLOUD, MINN. (976 MB.)				SAN ANTONIO, TEX. (985 MB.)				SAN JUAN, P. R. (1015 MB.)				SANTA MARIA, CALIF. (1005 MB.)				S. STE. MARIE, MICH. (988 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	20	17.7	88	31	966	19.9	70	31	317	19.4	78	31	240	30.1	56	31	19	26.3	84	31	71	14.1	84	31	221	14.9	83
1,000	31	117	19.8	79	31	90			31	111			31	105			31	154	25.8	82	31	114	13.8	83	31	119		
950	31	567	19.5	68	31	545			31	562	20.6	65	31	571	27.8	60	31	604	23.1	81	31	566	17.8	65	31	560	16.9	66
900	31	1,025	16.8	69	31	1,014			31	1,020	17.6	66	31	1,043	24.4	65	31	1,076	20.3	80	31	1,017	23.4	23	31	1,018	14.9	62
850	31	1,510	13.7	68	31	1,509	20.3	54	31	1,507	14.6	64	31	1,542	21.2	67	31	1,569	17.4	78	31	1,514	22.1	22	31	1,499	12.0	62
800	31	2,019	11.0	63	31	2,030	16.9	55	31	2,018	12.0	58	31	2,065	17.8	66	31	2,085	14.8	71	31	2,037	18.8	27	31	2,004	8.8	59
750	31	2,564	7.9	61	31	2,581	14.0	51	31	2,563	8.9	56	31	2,616	14.8	61	30	2,630	12.2	63	31	2,593	15.6	26	31	2,546	6.1	56
700	31	3,122	4.9	52	31	3,155	10.1	51	31	3,124	6.0	47	31	3,195	11.2	56	31	3,207	9.2	61	31	3,169	12.3		31	3,098	3.3	48
650	31	3,727	1.5	49	31	3,771	5.9	49	31	3,734	2.7	41	31	3,811	7.7	52	31	3,821	5.8	55	31	3,790	8.3		31	3,699	-0.1	43
600	31	4,364	-2.0	45	31	4,418	1.2	49	31	4,371	-1.2	37	31	4,466	3.9	46	31	4,470	2.1	50	31	4,441	4.0		30	4,333	-3.7	37
550	31	5,055	-5.8	42	31	5,116	-3.8	50	31	5,062	-5.6	38	31	5,175	-0.1	40	30	5,175	-1.8	46	31	5,143	-0.9		30	5,017	-7.8	36
500	31	5,791	-10.4	42	31	5,858	-8.7	49	31	5,800	-10.5	37	31	5,925	-4.5	32	31	5,921	-6.3	46	31	5,895	-6.2		30	5,750	-12.4	38
450	31	6,598	-15.7	41	31	6,672	-14.0	43	31	6,607	-15.8	35	31	6,755	-9.9	31	30	6,746	-11.4	47	31	6,720	-11.5		30	6,554	-17.8	36
400	31	7,473	-21.9	45	31	7,551	-20.3		31	7,481	-22.2		31	7,646	-15.7	29	30	7,634	-17.1	45	31	7,604	-18.0		30	7,418	-24.0	
350	31	8,442	-28.8	44	30	8,532	-27.2		30	8,446	-29.6		30	8,637	-23.1		30	8,621	-24.4	42	31	8,588	-25.1		30	8,377	-31.5	
300	30	9,523	-36.9		30	9,623	-35.8		29	9,536	-37.5		30	9,747	-31.5		30	9,724	-33.1	40	31	9,688	-33.2		30	9,450	-39.7	
250	28	10,758	-46.3		30	10,867	-44.0		29	10,773	-45.5		27	11,012	-41.5		30	10,980	-43.3		31	10,946	-42.3		30	10,672	-48.1	
200	27	12,212	-53.7		29	12,338	-52.1		29	12,237	-52.4		27	12,487	-53.5		28	12,440	-55.6		30	12,422	-53.0		30	12,126	-52.1	
175	25	13,067	-56.1		28	13,193	-56.5		29	13,094	-55.5		27	13,333	-59.5		28	13,278	-62.2		30	13,271	-58.7		30	12,987	-53.5	
150	23	14,043	-58.8		28	14,160	-60.8		29	14,068	-58.9		27	14,282	-65.9		26	14,216	-67.8		30	14,225	-64.7		29	13,974	-55.9	
125	22	15,182	-60.9		27	15,288	-64.4		27	15,205	-61.3		27	15,372	-71.4		25	15,304	-70.2		29	15,325	-69.5		29	15,128	-57.5	
100	20	16,575	-60.1		27	16,651	-63.9		26	16,591	-60.3		27	16,681	-72.5		24	16,626	-71.3		29	16,649	-70.2		28	16,538	-58.1	
80	18	17,973	-57.9		22	18,025	-61.4		24	17,990	-58.3		25	18,003	-68.0		18	17,942	-70.5		27	17,985	-65.4		25	17,951	-56.7	
60	12	19,798	-55.6		14	19,822	-57.8		19	19,804	-55.2		21	19,751	-62.0		12	19,685	-64.4		21	19,769	-60.1		14	19,811	-54.9	
50	7	20,971	-54.1		6	20,959	-54.4		11	20,965	-53.2		17	20,890	-58.5		8	20,821	-60.7		13	20,900	-57.4		9	20,980	-53.7	
40													7	22,307	-55.4		7	22,228	-56.6		7	22,326	-55.3					

Standard pressure surface (mb)	SPOKANE, WASH. (930 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (774 MB.)				TAMPA, FLA. (1017 MB.)				TATOOSH ISLAND, WASH. (1014 MB.)				TOLEDO, OHIO (993 MB.)				WASHINGTON, D. C. (1006 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	722	25.3	30	31	10	26.9	86	31	2,306	15.6	78	31	[illegible]	25.2	86	31	31	13.1	91	31	191	21.0	77	31	88	22.8	82
1,000	30	76			31	127	26.8	83	31	70			31	158	25.7	79	31	146	12.9	88	31	129			31	143	23.7	77
950	30	535			31	588	23.8	82	31	531			31	608	24.0	73	31	579	12.8	79	31	576	21.3	62	31	593	22.7	66
900	30	1,007	23.3	31	31	1,052	20.8	80	31	1,008			31	1,082	21.2	73	31	1,032	12.8	62	31	1,043	18.2	65	31	1,062	19.7	65
850	30	1,502	19.3	35	31	1,546	18.0	75	31	1,502			31	1,576	18.2	72	31	1,511	11.2	55	31	1,530	15.1	63	31	1,553	16.2	68
800	30	2,019	14.7	41	31	2,064	15.4	68	31	2,034			31	2,093	15.1	70	31	2,015	8.6	49	31	2,042	12.3	59	31	2,066	12.9	68
750	30	2,564	10.0	48	30	2,605	12.7	61	31	2,585	14.0	76	31	2,646	12.0	66	30	2,549	6.0	45	31	2,589	9.5	57	31	2,609	10.1	60
700	30	3,130	6.0	45	31	3,186	9.5	54	31	3,157	10.5	76	31	3,213	8.7	66	30	3,108	3.1	41	31	3,150	6.7	49	31	3,178	7.0	52
650	30	3,737	2.3	38	31	3,799	6.1	48	31	3,777	6.5	78	31	3,828	5.4	65	30	3,709	0.1	33	31	3,762	3.5	45	30	3,786	3.5	49
600	30	4,374	-1.7	33	31	4,449	2.3	47	31	4,425	2.4	81	31	4,474	1.8	63	30	4,342	-3.4	32	31	4,401	-0.4	46	30	4,428	-0.0	42
550	30	5,062	-5.9		30	5,149	-2.0	48	31	5,131	-1.7	80	30	5,181	-2.2	58	28	5,025	-7.6	31	31	5,094	-4.3	38	30	5,119	-3.8	32
500	29	5,806	-10.9		31	5,899	-6.6	50	31	5,878	-5.8	76	29	5,923	-6.5	58	27	5,758	-12.3		31	5,837	-8.8	38	30	5,866	-8.1	
450	29	6,610	-16.6		31	6,719	-11.4	44	31	6,707	-10.4	70	28	6,749	-11.3	55	27	6,561	-18.1		31	6,653	-13.8		30	6,681	-13.1	
400	29	7,481	-23.1		31	7,611	-16.8	43	31	7,597	-16.1	61	27	7,634	-16.9	55	27	7,424	-24.8		31	7,532	-19.8		28	7,566	-19.3	
350	29	8,443	-30.8		31	8,600	-23.6	36	31	8,588	-23.0	62	26	8,624	-23.8	50	27	8,380	-32.2		31	8,508	-27.1		28	8,545	-26.2	
300	29	9,519	-38.9		31	9,707	-32.1	34	30	9,699	-31.5	57	26	9,731	-32.1	47	27	9,448	-40.6		31	9,601	-34.9		28	9,642	-34.2	
250	29	10,745	-47.4		31	10,968	-42.1		28	10,962	-41.8		24	10,994	-42.0		27	10,668	-48.1		30	10,849	-43.8		28	10,891	-44.2	
200	28	12,200	-52.1		31	12,438	-54.7		25	12,436	-54.5		23	12,466	-54.1		27	12,119	-52.7		29	12,318	-52.9		28	12,352	-54.9	
175	28	13,061	-53.5		31	13,278	-61.4		16	13,283	-61.4		22	13,309	-60.3		26	12,980	-52.9		29	13,171	-56.8		27	13,192	-59.7	
150	28	14,048	-55.3		30	14,217	-68.1		13	14,219	-68.4		21	14,258	-66.2		26	13,971	-53.8		28	14,142	-61.0		27	14,145	-63.5	
125	28	15,204	-57.0		28	15,295	-72.4		11	15,299	-73.7		20	15,353	-69.5		25	15,142	-55.4		28	15,266	-63.9		25	15,263	-66.3	
100	24	16,611	-57.4		24	16,602	-72.6		8	16,607	-74.1		19	16,684	-68.8		25	16,558	-56.4		25	16,632	-62.8		20	16,606	-65.7	
80	22	18,033	-55.7		18	17,923	-69.4						15	18,039	-65.5		22	17,980	-55.8		22	18,006	-60.4		19	17,973	-61.4	
60	15	19,882	-53.7		17	19,655	-64.3						9	19,806	-61.5		19	19,816	-53.9		16	19,809	-56.6		17	19,767	-57.9	
50	6	21,054	-52.0		15	20,781	-60.7						7	20,946	-58.9		18	20,992	-53.3		11	20,961	-55.0		14	20,928	-55.4	
40					12	22,180	-56.9										13	22,456	-51.3						13	22,360	-53.0	
30					5	24,013	-54.2										10	24,329	-48.5						12	24,226	-49.3	
20																									9	26,910	-46.0	
15																									6	28,820	-45.0	

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

JULY 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	139	3.2	31	242	2.6	31	212	0.5	30	67	0.3	31	195	1.1	31	315	2.7	31	135	7.0	30	241	4.4	29	217	1.6	31	178	2.4	31	308	1.7	31	190	2.0
500	--	---	---	--	---	----	31	249	1.1	--	---	----	--	---	----	--	---	----	30	141	8.4	30	253	5.5	29	214	3.2	31	192	4.0	31	306	2.7	--	---	---
1,000	31	141	5.0	--	---	----	31	267	1.8	--	---	----	30	197	1.7	31	320	2.8	28	149	7.7	29	262	6.8	28	238	4.3	30	215	2.8	31	290	2.5	--	---	---
1,500	31	145	4.6	--	---	----	31	280	2.2	30	173	.3	30	234	2.2	31	319	2.2	22	159	5.4	26	267	7.6	26	260	6.1	30	269	2.2	29	266	3.2	31	170	2.5
2,000	29	156	4.8	31	247	3.4	30	305	2.4	30	169	.2	29	274	3.2	31	274	2.1	17	148	3.9	25	267	7.6	22	257	7.0	28	291	2.9	27	263	4.3	31	162	2.7
2,500	29	157	4.4	31	241	3.3	27	328	1.9	29	251	1.8	28	289	5.6	31	240	3.8	11	158	4.9	24	266	8.2	18	260	8.4	27	310	2.6	23	276	6.0	30	150	1.7
3,000	27	162	3.4	31	233	2.2	25	331	2.5	27	252	4.2	26	296	7.1	31	239	4.3	10	157	3.9	21	273	9.2	17	261	9.6	26	308	2.8	21	282	5.8	30	118	1.9
4,000	26	139	1.9	30	236	1.5	20	312	3.9	27	263	8.1	21	296	10.8	31	238	7.6				17	275	10.7	13	272	14.1	24	297	2.7	14	315	6.7	26	118	2.1
5,000	23	48	.5	29	256	1.3	13	328	5.4	24	264	10.9	18	297	13.2	30	239	9.7				10	283	11.8	10	271	15.8	20	297	2.9	12	322	9.7	26	114	3.1
6,000	22	44	1.6	28	239	2.3	10	321	5.4	19	264	13.0	12	293	16.7	27	243	12.0										18	285	1.8	11	327	9.3	24	110	2.4
8,000	16	80	2.1	16	215	3.8										24	246	15.2										12	326	.9				17	108	2.9
10,000	16	18	2.4	16	250	7.9																												15	139	2.6
12,000	10	360	2.5	12	253	12.1																												14	123	3.8
14,000				10	254	7.8																												12	142	1.9
16,000																																		11	97	3.0

Altitude (meters) m.s.l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	226	3.7	31	276	2.9	30	346	0.3	31	271	1.8	28	100	2.3	31	226	1.5	31	200	2.3	29	141	0.9	31	302	3.2	31	127	2.8	29	182	2.0	31	319	1.1
500	--	---	----	--	---	----	30	259	.7	--	---	----	28	142	2.8	31	230	2.0	--	---	---	29	163	1.7	31	299	3.3	31	131	3.9	29	189	2.8	31	320	1.4
1,000	--	---	----	--	---	----	30	247	1.3	31	265	2.5	28	190	1.7	29	249	2.2	31	207	4.1	29	176	1.3	31	313	3.2	31	130	3.9	26	194	1.7	31	296	1.6
1,500	--	---	----	31	276	3.0	30	254	2.3	31	260	3.4	27	235	2.0	26	262	3.8	31	204	4.9	27	238	1.2	31	280	2.2	31	125	2.9	21	214	.2	30	291	2.2
2,000	31	229	3.6	31	278	3.4	25	270	3.1	31	260	4.4	27	251	2.4	24	271	5.0	31	202	5.4	20	290	1.3	31	233	2.8	30	124	2.1	12	90	.3	28	290	3.3
2,500	31	225	4.1	31	274	3.4	26	301	4.5	31	262	5.6	23	274	1.7	22	284	5.4	31	198	6.0	16	260	1.5	31	205	4.2	29	133	2.2				23	285	3.6
3,000	31	222	4.0	31	271	3.9	24	297	5.4	28	263	5.8	20	326	.7	22	288	7.3	31	201	6.6	14	302	1.4	31	209	5.6	28	132	2.5				21	282	5.6
4,000	26	223	5.0	29	256	5.3	23	292	6.1	22	259	10.4	20	337	.7	21	299	10.3	31	204	6.7				29	217	7.1	24	138	2.2				16	291	6.5
5,000	24	218	7.1	28	242	6.4	17	278	6.3	19	266	14.1	20	284	1.0	16	306	11.6	27	212	6.7				28	224	9.9	21	148	2.2				13	298	6.1
6,000	22	236	9.8	27	249	7.0	16	284	6.8	15	267	15.6	17	276	1.7	11	312	13.7	25	215	7.2				27	225	11.3	18	116	2.2				10	317	6.2
8,000	18	239	15.8	17	249	11.4	13	291	7.2	13	263	19.4	11	42	2.6				12	230	8.7				25	230	15.5									
10,000	12	235	24.6	11	254	18.5	11	290	6.5																17	224	18.5									

Altitude (meters) m.s.l.	New York, N.Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	183	2.2	29	271	5.1	31	162	4.6	31	146	0.7	31	265	1.6	30	132	1.0	30	258	1.4	29	247	1.1	31	146	3.7	30	252	3.4	31	270	3.3	31	255	2.1
500	29	242	4.5	27	283	5.0	31	166	4.8	31	165	1.5	31	264	1.9	--	---	----	30	240	2.0	29	242	1.8	31	147	6.0	29	283	2.5	31	279	5.2	31	276	1.7
1,000	29	257	5.5	25	275	2.6	30	175	5.4	29	168	2.6	31	256	2.8	30	127	1.0	30	233	3.5	29	250	2.5	31	144	6.1	27	292	1.7	31	280	6.3	29	296	1.0
1,500	25	268	7.2	24	251	2.5	29	187	5.3	27	199	2.0	31	242	2.8	30	195	.8	26	246	5.2	21	259	3.7	31	139	5.6	26	265	1.7	26	290	6.5	29	260	.8
2,000	21	276	6.6	24	224	2.5	27	196	5.0	25	247	2.9	31	219	2.5	28	258	1.2	23	273	5.7	19	273	5.5	30	135	5.3	26	213	2.2	24	291	8.0	29	227	1.6
2,500	16	297	5.3	23	213	3.1	28	203	4.4	24	273	4.4	31	209	2.4	24	268	3.0	18	284	6.9	14	286	5.1	26	140	4.6	26	182	2.7	18	295	8.3	27	231	2.2
3,000	13	295	5.3	23	202	4.8	28	232	2.8	22	288	5.2	31	201	2.3	21	268	5.3	17	287	8.4	13	285	5.5	25	139	3.5	25	167	4.0	15	297	9.2	26	232	3.0
4,000				22	210	8.3	24	301	3.5	21	292	6.7	30	194	2.2	18	282	7.7	14	284	12.2	11	283	7.0	20	119	1.8	25	171	5.4				26	235	5.6
5,000				22	207	9.6	21	304	4.0	18	308	9.1	29	180	3.9	15	285	10.6	11	288	13.1				13	107	2.8	24	165	4.8				26	243	7.7
6,000				20	221	9.1	16	314	4.5	16	312	8.9	28	176	4.6													23	161	5.1				24	239	10.0
8,000				17	224	9.7	12	328	5.3	13	305	10.4	24	182	4.8													20	162	5.1				22	234	12.5
10,000				14	224	17.1							18	216	8.0													16	167	8.3				15	247	14.5
12,000													16	230	8.9													12	188	9.9				10	251	14.5
14,000													13	237	4.8																					
16,000													12	189	4.6																					

Altitude (meters) m.s.l.	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	206	2.4	31	214	1.2
500	--	---	----	31	232	2.0
1,000	31	215	2.7	31	244	2.8
1,500	31	227	3.2	31	268	4.2
2,000	29	226	3.3	25	279	4.9
2,500	28	227	4.8	22	289	5.6
3,000	28	225	5.6	20	284	7.0
4,000	28	239	8.4	17	292	5.8
5,000	24	241	10.1	13	301	6.4
6,000	23	248	11.6			
8,000	20	246	14.2			
10,000	12	260	13.7			

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	139	3.4	31	142	5.0	31	107	1.0	31	130	5.6	31	196	1.6	31	241	1.7	31	204	1.3	31	140	1.3	31	79	0.9	31	215	0.9	31	204	3.0	31	233	0.6
500	—	—	—	—	—	—	—	—	—	30	148	9.7	30	178	2.3	31	263	5.2	31	213	4.7	31	181	2.6	—	—	—	30	211	2.8	31	237	5.2	31	243	1.8
1,000	—	—	—	31	152	7.7	30	249	.6	30	149	9.4	30	137	1.3	31	262	5.8	31	228	3.2	31	216	3.2	—	—	—	30	232	3.3	31	245	4.9	31	273	4.1
1,500	—	—	—	31	152	8.6	30	257	2.1	30	145	7.1	30	80	2.1	31	259	6.0	31	261	2.1	31	252	3.6	31	74	.8	30	263	3.0	31	261	4.7	31	276	5.3
2,000	31	185	3.2	31	153	7.8	30	278	3.3	31	141	5.4	31	74	2.7	31	262	7.9	31	268	2.3	31	279	4.1	31	243	1.1	30	283	3.2	31	257	4.8	31	286	6.3
2,500	31	201	2.6	31	151	5.9	30	286	5.0	31	131	4.1	31	67	3.2	31	260	8.8	31	265	2.3	31	280	5.3	31	272	1.8	30	292	3.0	31	251	4.9	31	295	7.1
3,000	31	221	2.8	30	129	3.6	30	292	6.8	31	127	3.5	31	61	3.0	31	260	9.5	31	267	2.2	31	282	6.0	31	268	2.3	29	302	3.3	31	249	5.0	31	288	8.3
4,000	31	264	1.9	30	58	3.7	30	295	9.7	31	104	3.1	31	40	2.0	31	258	11.6	31	276	2.2	31	301	5.7	31	258	3.6	29	288	5.0	31	262	3.7	31	291	11.3
5,000	31	317	1.6	29	56	5.3	30	292	12.5	31	103	3.6	31	29	1.7	31	258	13.6	31	290	1.0	30	313	7.3	31	253	5.0	29	287	4.9	31	271	4.0	31	289	14.6
6,000	31	311	1.3	28	59	4.6	31	284	15.2	31	93	3.8	31	33	1.7	31	257	15.1	31	289	1.4	30	309	8.7	31	247	7.4	30	295	5.6	31	266	4.3	27	287	15.9
8,000	30	251	3.7	27	64	5.0	30	289	21.5	30	72	4.9	31	41	2.2	31	255	21.2	31	323	2.2	30	291	12.5	31	253	11.2	29	286	8.5	31	276	5.6	23	291	21.0
10,000	29	253	5.3	24	44	4.0	25	276	23.7	29	68	5.3	30	55	2.4	27	262	22.5	31	331	3.6	28	286	16.0	27	252	13.7	29	282	9.2	30	281	8.1	16	292	25.7
12,000	29	263	5.6	20	43	4.5	19	285	25.8	28	77	5.8	30	57	4.2	25	267	23.4	31	315	4.2	26	276	17.3	23	250	15.0	28	287	11.0	30	278	9.9	12	296	28.8
14,000	27	254	6.5	18	75	5.3	16	285	21.6	27	69	5.7	30	63	5.8	21	264	21.6	31	6	3.7	25	285	15.3	19	243	12.2	27	296	9.7	24	315	5.3			
16,000	24	122	2.4	15	67	6.3	14	288	13.1	25	73	7.3	28	66	5.7	14	252	13.6	27	28	3.9	20	298	11.2	16	252	6.2	23	324	7.2	16	38	4.1			
18,000	19	103	4.1	13	89	8.8				22	82	10.6	26	75	9.2				21	73	4.8				15	160	1.9	18	71	2.5	10	76	4.9			
20,000	11	95	8.5							12	88	16.7	15	83	12.2				11	82	7.7							12	85	5.9						

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	174	0.9	31	333	5.8	31	73	1.1	30	230	2.1	31	208	0.8	31	276	4.3	30	140	4.4	31	95	1.1	31	134	6.2	31	119	4.4	31	164	0.8	31	271	4.0
500	31	167	2.8	31	331	6.1	31	122	3.7	29	241	6.5	30	205	1.4	31	279	5.4	27	142	5.5	—	—	—	31	143	9.2	31	89	8.4	31	219	1.8	31	319	3.3
1,000	31	166	2.6	31	328	6.0	31	131	4.3	29	252	6.5	30	216	2.0	31	283	5.3	27	169	7.9	31	108	1.3	31	147	8.9	31	95	9.6	31	256	3.5	31	326	4.0
1,500	31	181	2.4	31	314	4.4	31	129	4.2	30	262	6.4	30	253	2.3	31	269	3.5	27	185	5.8	31	184	2.5	31	143	6.2	31	93	10.0	31	267	5.1	31	5	2.4
2,000	31	183	2.0	31	293	2.6	31	131	3.7	30	257	7.3	31	269	3.0	31	245	2.8	28	206	3.9	31	208	2.5	31	131	3.6	31	94	9.7	31	288	5.8	31	59	2.2
2,500	31	225	.9	31	249	2.7	31	133	3.0	30	258	8.4	30	283	3.6	31	234	3.3	29	229	2.6	31	240	2.3	31	119	3.5	31	92	9.3	31	295	6.9	30	129	1.1
3,000	31	290	1.1	31	222	4.8	31	127	2.7	30	258	9.6	30	286	4.0	31	225	4.2	30	255	1.0	31	267	4.5	31	98	3.2	31	93	9.6	30	298	7.5	30	219	1.8
4,000	31	332	2.5	31	221	7.4	30	130	2.6	30	260	10.5	30	301	4.1	31	218	6.0	30	351	3.2	31	277	8.1	31	72	2.7	30	95	8.4	30	296	10.6	31	244	2.8
5,000	30	348	5.2	31	229	8.0	29	112	2.4	30	256	11.8	31	311	5.0	31	224	6.7	30	341	4.4	31	283	10.9	31	70	3.8	30	84	7.1	30	294	14.1	30	224	3.8
6,000	30	346	6.4	31	238	10.0	29	115	3.0	30	256	13.4	31	316	5.9	31	230	7.9	29	334	5.3	31	281	14.0	30	65	4.4	29	88	4.9	30	291	16.2	31	224	5.4
8,000	30	334	7.6	28	238	14.1	25	97	2.0	27	269	16.7	31	306	9.1	30	235	10.2	29	307	5.9	31	274	19.4	30	56	4.6	28	122	2.2	29	290	22.1	31	222	7.7
10,000	29	342	6.7	26	240	19.0	26	43	4.1	25	276	20.5	29	296	11.1	28	229	14.4	29	304	8.1	29	273	23.0	28	55	5.7	28	225	1.0	22	292	25.4	31	221	11.9
12,000	28	344	4.5	24	241	25.0	25	29	6.1	23	272	23.3	28	295	10.8	27	231	18.0	28	302	8.3	28	277	28.4	23	69	6.4	27	249	5.9	19	286	30.3	30	216	12.6
14,000	23	359	4.7	20	236	21.5	25	53	9.2	19	282	20.5	24	303	8.3	15	220	15.1	26	311	6.2	23	270	23.8	22	47	5.9	25	259	6.9	16	287	24.6	29	211	11.1
16,000	19	5	5.5				16	79	8.1	10	282	5.6	22	330	8.8				20	327	3.9	22	271	13.4	16	74	4.2	22	92	2.9	15	284	17.8	29	191	6.3
18,000	18	51	4.2				16	92	11.9				15	79	1.4				15	91	3.4	12	272	7.7	15	82	6.9	14	96	9.1	15	300	8.2	27	126	3.4
20,000	15	77	8.9				11	82	15.7				14	88	8.1										10	82	12.2							11	108	9.2

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	254	1.5	31	236	1.7	31	213	3.9
500	30	270	5.3	—	—	—	31	267	4.3
1,000	30	286	6.9	31	249	2.5	30	282	2.5
1,500	29	286	6.4	31	250	2.5	30	258	.8
2,000	30	298	6.8	31	249	2.7	29	224	1.0
2,500	29	297	8.0	31	248	3.7	29	219	2.0
3,000	29	287	8.4	31	248	5.0	29	228	2.5
4,000	26	288	10.6	31	244	8.3	29	239	4.5
5,000	25	292	13.1	30	249	10.3	27	257	5.7
6,000	25	288	14.8	30	247	12.9	26	262	6.2
8,000	21	280	19.8	29	247	16.8	24	239	8.8
10,000	12	289	24.7	23	257	19.8	23	237	12.9
12,000				18	255	19.2	20	241	14.7
14,000				12	271	12.3	16	242	10.9
16,000							13	259	7.0
18,000							10	340	2.9

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30.—Solar radiation intensities, tabulated in langleys per minute. JULY 1951

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
TABLE MOUNTAIN, CALIF.											
	Air mass										
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
July										Mb.	Mb.
1	1.15	1.24	1.33	1.47	----	----	----	----	----		
2	1.14	1.22	1.31	1.45	----	----	----	----	----		
3	1.13	1.21	1.29	1.43	----	----	----	----	----		
4	1.15	1.23	1.33	1.46	----	----	----	----	----		
6	----	----	----	1.38	----	----	----	----	----		
7	----	----	----	1.33	----	----	----	----	----		
8	----	----	----	1.36	----	----	----	----	----		
9	----	----	----	1.36	----	----	----	----	----		
10	----	----	----	1.40	----	----	----	----	----		
11	----	----	----	1.48	----	----	----	----	----		
13	----	----	----	1.49	----	----	----	----	----		
18	----	----	----	1.17	----	----	----	----	----		
29	----	----	----	1.37	----	----	----	----	----		
30	----	----	----	1.38	----	----	----	----	----		
31	----	----	----	1.28	----	----	----	----	----		
Averages	1.14	1.23	1.32	1.39	----	----	----	----	----		
Departures	+.01	+.02	+.01	-.02	----	----	----	----	----		
LINCOLN, NEBR.											
	Air mass										
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
July										Mb.	Mb.
3	----	----	----	----	----	1.12	0.99	0.88	0.79	21.8	19.0
9	----	----	----	----	1.25	1.03	.86	.73	----	16.5	17.7
13	----	----	----	----	1.36	1.17	1.01	.90	.79	15.3	16.9
14	----	----	----	----	1.35	1.12	.94	----	----	16.9	19.0
16	----	----	----	----	1.26	1.03	.84	.71	.60	26.8	31.7
19	----	----	----	----	1.24	.99	.86	.75	.67	25.0	25.0
23	----	----	----	----	1.30	1.10	.88	----	----	19.0	16.9
24	----	----	----	----	1.36	1.19	1.01	.90	.84	18.3	18.3
25	----	----	----	----	1.30	1.10	.84	.79	.69	25.0	29.6
31	----	----	----	----	1.30	1.12	.94	.84	.71	17.7	15.3
Averages	----	----	----	----	1.30	1.10	.92	.81	.73		
Departures	----	----	----	----	-.03	+.04	+.04	+.06	+.06		
MADISON, WIS.											
	Air mass										
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
July										Mb.	Mb.
5	0.74	0.83	0.95	1.11	1.33	----	----	----	----	12.7	11.8
6	.71	.79	.92	1.06	1.30	----	----	----	----	13.2	12.7
14	.64	.73	.81	.99	1.20	----	----	----	----	18.3	17.7
19	.83	.94	1.03	1.16	1.35	----	----	----	----	13.7	12.3
20	.76	.80	.92	1.10	1.23	----	----	----	----	13.7	12.7
24	.66	.76	.87	1.03	1.26	----	----	----	----	21.1	17.0
25	.65	.74	.84	.99	1.22	----	----	----	----	21.8	19.6
26	.52	.60	.73	.90	1.16	----	----	----	----	21.8	20.4
31	.61	.75	.91	1.08	1.36	----	----	----	----	21.1	17.0
Averages	.68	.77	.89	1.05	1.27	----	----	----	----		
Departures	+.04	+.03	+.03	+.01	-.01	----	----	----	----		
BOSTON, MASS.											
	Air mass										
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
										Mb.	Mb.
	NO DATA DURING JULY 1951										

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
TACUBAYA, D. F., MEXICO											
	Air mass										
	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
										Mb.	Mb.
	NO DATA DURING JULY 1951										
BLUE HILL, MASS.											
	Air mass										
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
July										Mb.	Mb.
2	0.65	0.79	0.91	1.09	----	1.03	0.79	0.67	0.58	17.2	15.5
3	----	.79	.94	1.16	----	----	----	----	----	15.5	15.0
7	.83	.91	1.02	1.17	1.35	----	.91	.77	.68	15.2	13.7
8	----	----	----	1.00	----	----	----	----	----	16.0	15.5
14	----	----	----	.93	----	----	.70	.60	.49	20.0	12.9
15	.67	.77	.89	1.04	1.30	1.08	.91	.78	.67	17.4	15.7
16	.53	.62	.73	.87	1.18	----	----	----	----	19.1	20.5
21	----	----	----	1.11	----	----	----	----	----	13.3	14.4
25	.70	.79	.92	1.07	1.36	----	.85	.73	.63	17.6	16.3
26	.54	.63	.79	1.01	1.30	.99	.76	.64	.54	14.8	18.9
Averages	.65	.76	.89	1.05	1.30	1.03	.82	.70	.60		
Departures	+.01	+.03	+.02	+.02	+.01	+.01	-.02	-.01	-.03		
ALBUQUERQUE, N.M.											
	Air mass										
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
July										Mb.	Mb.
1	0.57	0.66	1.06	1.06	1.31	----	0.99	0.94	0.92	9.1	5.2
2	.67	.78	.95	1.16	1.42	1.38	1.23	1.13	1.08	8.2	2.4
3	.90	.98	1.12	1.27	1.47	1.34	1.21	1.09	.92	2.5	4.4
4	.78	.87	1.01	1.16	1.35	1.20	----	----	----	7.0	5.0
6	----	----	----	----	----	1.21	1.06	----	----	4.2	5.0
7	.80	.89	1.03	1.19	1.42	----	----	1.03	----	6.3	4.0
8	.84	.94	1.08	1.24	1.44	----	----	----	----	3.6	5.8
9	----	----	1.07	1.28	----	----	----	----	----	2.4	4.8
10	----	----	----	1.15	----	1.25	----	.93	----	4.6	4.6
11	----	.90	1.02	1.22	1.32	----	----	----	----	4.4	6.5
12	----	.70	----	----	----	----	----	----	----	8.2	8.8
15	.78	.85	.99	1.18	1.40	----	----	----	----	10.2	6.5
16	.78	.89	1.02	1.21	1.31	1.32	1.24	1.17	1.14	9.4	4.0
17	.64	.77	.91	1.12	1.36	1.20	1.08	.94	.90	8.8	7.6
20	.79	.90	1.02	1.21	1.37	----	----	----	----	8.5	8.2
21	.76	.88	1.01	1.18	1.36	----	----	----	----	7.6	7.9
23	.77	.90	1.03	1.16	1.52	----	----	----	----	10.2	9.1
24	----	----	----	1.17	----	----	----	----	.86	10.6	8.5
25	.69	.78	.86	1.10	1.47	----	----	----	----	11.3	9.8
26	----	----	.98	1.16	----	----	----	----	----	11.4	8.5
27	.79	.91	1.03	1.20	1.37	1.27	1.14	----	----	10.2	7.6
28	.80	.92	1.04	1.16	1.36	1.25	1.12	1.05	1.00	7.9	7.3
30	----	----	.93	1.16	1.35	----	----	----	----	8.2	11.8
Averages	.76	.85	1.00	1.18	1.39	1.27	1.13	1.04	.97		
Departures	+.03	+.04	+.06	+.07	+.01	+.13	+.14	+.11	+.15		

*Extrapolated

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	2	3	4	5	6	7	8	Average	9	10	11	12	13	14	15	Average	16	17	18	19	20	21	22	Average
Langleys	210	212	232	213	153	247	260	218	261	253	220	101	200	209	243	212	235	193	272	---	---	---	116	204
Date	23	24	25	26	27	28	29	Average																
Langleys	193	272	274	266	268	82	132	212																

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	2	3	4	5	6	7	8	Average	9	10	11	12	13	14	15	Average	16	17	18	19	20	21	22	Average
Langleys	192	178	161	135	133	180	176	165	181	176	175	92	174	165	164	161	154	121	151	---	---	---	117	136
Date	23	24	25	26	27	28	29	Average																
Langleys	150	134	152	142	155	90	139	138																

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	2	3	4	5	6	7	8	Average	9	10	11	12	13	14	15	Average	16	17	18	19	20	21	22	Average
Langleys	175	---	281	232	253	109	196	208	253	283	309	172	283	215	120	234	193	224	265	---	---	---	203	221
Date	23	24	25	26	27	28	29	Average																
Langleys	293	146	120	121	273	140	230	189																

Note.—Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1951	Aklavik, MacKenzie	Albuquerque, N. Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Tex.	Canton Is., Pac.Area	Caribou, Me.
July 2-------		797		523	439	523	591	790		683	746	----	614
July 3-------		812		337	417	426	313	732		708	775	(628)	585
July 4-------		794		250	658	413	172	573		619	771	619	457
July 5-------		672		674	689	417	191	502		508	786	----	85
July 6-------		775		386	699	548	199	312		323	693	----	163
July 7-------		775		487	764	535	302	728		682	716	(609)	649
July 8-------		749		706	740	392	269	659		635	788	(637)	685
Averages------		768		480	629	465	291	614		594	754	----	462
Departures----		+50		+24	----	----	-112	+40		+40	----	----	-56
July 9-------		734		682	728	281	426	627		626	798	612	512
July 10-------		793		734	743	388	(633)	580		518	747	----	625
July 11-------		747		733	702	796	576	468		492	516	(607)	557
July 12-------		588		627	427	347	658	172		112	658	----	69
July 13-------		524		682	672	449	294	428		564	418	----	658
July 14-------		690		715	679	631	170	538		655	467	----	767
July 15-------		661		563	584	625	224	680		632	339	607	422
Averages------		677		677	648	501	(426)	499		514	563	----	516
Departures----		-1		+202	----	----	+50	-14		+48	----	----	-36
July 16-------		774		501	669	255	210	557		593	772	522	232
July 17-------		772		396	620	537	85	395		418	770	582	740
July 18-------		485		565	633	307	151	602		622	778	611	786
July 19-------		434		576	674	426	162	---		134	697	(488)	95
July 20-------		686		512	698	429	86	---		673	698	525	612
July 21-------		709		421	721	317	238	---		669	727	541	674
July 22-------		659		655	551	296	560	225		256	735	581	(311)
Averages------		645		518	652	367	213	445		481	739	(550)	(493)
Departures----		-20		+24	----	----	-108	-44		+41	+71	----	-51
July 23-------		625		648	713	496	(342)	378		369	734	570	749
July 24-------		674		562	687	176	237	614		634	719	545	774
July 25-------		746		685	563	160	(277)	672		666	755	(619)	577
July 26-------		654		670	346	280	158	650		659	739	631	346
July 27-------		731		626	496	458	261	544		519	726	681	715
July 28-------		779		349	398	551	340	140		126	714	(579)	726
July 29-------		701		61	691	340	511	239		219	729	602	443
Averages------		701		514	556	351	(304)	462		456	731	(604)	619
Departures----		+45		-8	----	----	+14	-16		-10	+33	----	+95
Accumulated Departures January 1 to July 29, 1951		+574		+2254	----	----	-1554	+2730		+1414	----	----	----

1951	Charleston, S.C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Gainesville, Fla.
July 2-------	314	769	591	688	699	634	601	680	684	799	547	389	794	561
July 3-------	512	721	395	666	703	203	692	538	763	806	466	761	800	226
July 4-------	567	289	743	411	703	458	556	480	724	836	553	703	810	637
July 5-------	701	759	134	675	698	683	607	85	701	841	135	766	792	646
July 6-------	622	771	246	761	693	649	318	358	776	838	229	765	786	344
July 7-------	755	776	697	740	689	595	706	469	764	818	577	769	768	244
July 8-------	647	559	532	554	695	(154)	672	380	690	819	630	774	783	615
Averages------	588	663	477	642	697	(482)	593	427	729	822	448	704	790	468
Departures----	+51	----	----	----	-18	-18	+43	-57	+25	+142	-22	+81	+76	-11
July 9-------	637	438	561	422	677	(405)	598	638	725	786	464	775	748	471
July 10-------	560	572	397	519	668	514	570	744	714	587	730	690	764	610
July 11-------	612	356	299	561	659	109	514	680	725	742	706	672	751	588
July 12-------	731	141	----	451	670	453	392	344	734	785	721	751	744	579
July 13-------	637	457	----	231	683	596	475	141	(675)	795	702	724	738	615
July 14-------	464	680	(647)	573	683	280	413	158	689	788	(709)	635	754	652
July 15-------	488	704	677	665	696	571	659	324	766	370	696	620	746	657
Averages------	590	478	(516)	489	677	(418)	517	433	(718)	693	(675)	696	750	596
Departures----	+46	----	----	----	-15	-35	+19	-35	+38	+44	+165	+79	+46	+73
July 16-------	367	574	----	613	665	465	580	----	634	567	593	704	717	583
July 17-------	407	669	724	498	660	405	257	----	603	665	350	719	694	494
July 18-------	554	625	----	549	641	369	610	----	768	531	305	690	689	279
July 19-------	351	646	----	655	500	496	253	----	771	491	379	714	619	284
July 20-------	644	778	(607)	768	678	625	533	----	740	424	521	696	691	543
July 21-------	529	428	662	505	669	161	----	----	743	559	396	738	768	458
July 22-------	724	333	564	418	647	292	----	----	682	769	439	722	725	624
Averages------	511	579	----	572	637	402	446	----	706	572	426	712	700	466
Departures----	-36	----	----	----	-44	-39	-22	----	+29	-40	-3	+85	+9	-1
July 23-------	585	615	363	345	679	262	350	----	690	759	555	721	735	525
July 24-------	368	719	586	379	752	543	543	----	538	779	288	568	748	615
July 25-------	613	682	584	636	760	567	675	----	765	635	403	495	744	643
July 26-------	254	651	655	638	764	557	637	----	695	606	471	662	735	618
July 27-------	610	493	683	604	756	(372)	487	----	732	644	458	697	698	543
July 28-------	613	553	623	521	714	215	191	----	717	367	378	661	679	494
July 29-------	248	709	641	577	742	605	226	----	630	470	198	687	718	302
Averages------	470	632	591	529	738	(446)	444	----	681	608	393	642	722	534
Departures----	-63	----	----	----	+70	-24	-37	----	+21	+6	-11	+41	+46	+41
Accumulated Departures January 1 to July 29, 1951	----	----	----	----	-1883	-5341	-2653	----	----	----	+6524	----	+5614	+2576

1951	Glasgow, Mont.	Grand Junction, Colo.	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N.Y.	Jeanerette, La.	Keflavik, Iceland
July 2-------	332	801	642	331	426		624	672	840	605		
July 3-------	801	780	738	390	453		629	688	866	732		
July 4-------	676	814	788	486	630		703	523	865	256		
July 5-------	798	717	616	665	694		571	647	869	168		
July 6-------	817	801	808	713	714		720	743	860	787		
July 7-------	728	821	794	661	791		780	732	----	782		
July 8-------	406	820	847	642	782		788	464	851	685		
Averages------	651	793	747	555	642		688	638	859	574		
Departures----	-24	----	+107	----	+61		+56	+58	+62	+16		
July 9-------	473	813	803	582	767		759	382	830	676		
July 10-------	582	477	407	647	764		753	450	824	612		
July 11-------	779	765	758	619	688		698	442	841	461		
July 12-------	791	772	807	595	578		511	411	826	165		
July 13-------	768	799	773	567	719		613	285	836	690		
July 14-------	648	791	660	372	686		661	479	812	----		
July 15-------	774	684	623	499	500		468	664	766	----		
Averages------	688	729	690	554	672		637	445	819	521		
Departures----	-5	----	+69	----	+108		-17	-122	+44	-9		
July 16-------	735	553	(419)	583	667		618	523	722	----		
July 17-------	750	644	418	595	694		752	617	756	----		
July 18-------	758	766	623	542	689		731	543	728	286		
July 19-------	577	656	736	561	578		467	704	513	434		
July 20-------	775	519	584	641	719		679	703	765	564		
July 21-------	728	588	341	598	620		589	472	796	597		
July 22-------	778	748	669	597	556		683	431	794	211		
Averages------	729	639	(541)	588	646		645	570	725	418		
Departures----	+46	----	-53	----	+80		+12	+20	-17	-83		
July 23-------	745	601	(618)	526	736		704	377	765	675		
July 24-------	530	781	680	524	686		728	415	804	738		
July 25-------	635	755	658	----	463		697	673	686	736		
July 26-------	735	513	514	459	416		653	653	616	648		
July 27-------	707	644	480	560	449		713	360	756	448		
July 28-------	719	582	612	469	442		729	557	249	305		
July 29-------	501	705	628	435	377		649	564	773	670		
Averages------	662	654	(598)	495	510		696	514	664	603		
Departures----	+35	----	+25	----	-53		+16	-41	-48	+109		
Accumulated Departures January 1 to July 29, 1951	----	----	+476	----	----		+2380	----	+1932	+133		

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. –Continued

	Lake Charles, La.	Las Vegas, Nev.	Lexington, Ky.	Lincoln, Nebr.	Little Rock, Ark.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Miami, Fla.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T.H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S.D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste.Marie, Mich.	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle (U. of W.), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W.I.	Thule, Greenland	Toronto, Ont.	Upton, N.Y.	Wake Island, Pac.Area	Washington, D.C.	Winnipeg, Manitoba
1951																																							
July 2-------	644	755		470	150	620	550	802	756	628	682		199	319	697	692	755	731	322	584	----	696	610	644		----	678	585	708	712	762	605	461		701	506		(523)	775
July 3-------	688	749		692	566	710	199	619	646	194	759		288	(308)	738	552	759	660	705	568	84	698	671	620		----	662	666	270	707	637	629	(689)		603	738		(699)	479
July 4-------	682	781		684	522	602	259	----	585	650	568		618	426	150	654	768	402	438	647	----	725	724	729		484	400	453	271	637	308	554	632		209	498		(516)	757
July 5-------	690	771		244	609	405	713	735	493	598	666		212	680	189	684	382	799	735	682	----	735	736	731		547	356	525	401	263	368	669	230		524	548		624	771
July 6-------	640	756		434	642	356	758	808	717	618	403		684	789	812	709	728	780	719	693	----	753	669	803		662	537	734	611	415	754	699	496		706	(618)		767	445
July 7-------	568	743		649	527	804	436	800	354	748	770		690	732	760	673	708	751	765	682	471	743	739	756		----	638	757	728	784	754	676	634		530	757		748	459
July 8-------	(645)	758		445	632	551	89	(799)	383	636	754		221	761	519	714	710	535	601	683	634	730	700	712		----	589	736	581	528	696	703	671		485	735		740	629
Averages------	(651)	759		517	521	578	429	(760)	562	582	658		416	(573)	552	668	687	365	612	648	----	726	693	714		----	551	637	510	578	611	648	(545)		537	(629)		(660)	616
Departures----	+97	+63		-73	----	----	-123	-20	----	+56	+83		-29	+29	+3	+60	+9	+62	-33	+29	----	+83	----	+17		----	----	+102	-78	-114	+94	+98	----		+4	+114		----	+69
July 9-------	670	756		448	675	614	743	798	329	520	712		326	685	332	734	728	467	307	596	584	711	628	702		681	606	680	447	658	668	648	552		301	702		(704)	521
July 10-------	618	759		201	665	559	407	782	320	460	702		712	465	574	726	729	613	138	613	658	696	667	544		680	507	639	737	789	565	641	670		593	662		609	686
July 11-------	460	771		118	611	479	213	779	459	595	586		781	510	227	619	720	539	174	642	585	719	638	582		665	454	721	731	770	434	712	663		224	660		713	535
July 12-------	653	791		72	674	99	653	772	537	600	358		398	609	228	602	722	242	575	674	640	714	625	638		443	84	514	697	762	339	621	665		66	438		611	726
July 13-------	587	749		541	518	692	512	763	421	620	599		357	592	699	573	723	716	811	657	760	697	613	687		475	624	316	629	727	337	498	(380)		666	547		477	744
July 14-------	585	734		667	302	713	648	764	505	485	696		455	547	778	657	708	778	785	634	726	609	591	655		708	660	495	564	672	704	349	650		664	691		503	336
July 15-------	430	609		651	492	684	734	767	727	510	731		416	680	590	634	695	688	700	590	587	583	473	700		660	681	529	565	664	609	680	532		603	(680)		521	294
Averages------	572	738		386	562	547	559	775	471	541	626		492	584	490	649	718	577	498	629	648	676	605	644		616	517	556	624	720	522	593	(587)		448	(626)		(591)	549
Departures----	+52	+46		-191	----	----	+8	-1	----	+52	+103		-36	+72	-63	+28	+43	+28	-124	+24	+69	+31	----	-22		+125	----	+53	+48	+30	-3	+71	----		-60	+142		----	-4
July 16-------	480	526		660	527	630	399	748	714	569	627		497	634	----	660	692	635	559	439	436	385	687	750		539	576	449	704	739	674	675	(616)		391	575		583	696
July 17-------	523	679		618	660	531	266	730	465	653	242		621	647	----	710	641	536	452	566	324	681	703	729		288	418	361	410	720	536	653	669		557	296		435	618
July 18-------	655	547		616	417	740	492	766	704	656	598		684	668	----	681	689	635	735	387	702	658	705	711		231	291	380	503	745	238	649	705		627	277		358	660
July 19-------	540	490		632	669	133	756	768	744	607	240		631	616	----	532	722	651	757	557	742	471	683	618		154	129	357	480	758	318	657	560		669	(455)		461	700
July 20-------	565	629		598	655	665	662	754	464	597	760		719	634	----	652	692	731	549	619	332	288	663	717		765	653	663	685	760	633	648	(690)		550	771		653	394
July 21-------	549	719		504	667	655	248	763	419	588	741		561	641	----	589	718	335	168	637	629	469	719	647		715	580	625	704	689	609	632	481		251	699		621	503
July 22-------	475	701		461	675	245	284	750	561	498	231		423	547	----	653	717	396	405	657	740	703	679	634		(252)	190	497	709	728	218	641	694		450	(278)		578	715
Averages------	541	613		584	610	514	444	754	582	595	491		591	627	----	639	696	560	518	552	558	522	691	687		(421)	405	476	599	734	461	651	(631)		499	(479)		527	612
Departures----	+18	-72		+12	----	----	-89	+2	----	+75	+7		+70	+115	----	+12	+27	+23	-118	-30	-16	-95	----	+37		-70	----	-18	+34	+67	-23	+156	----		+46	+3		----	+52
July 23-------	463	689		626	477	402	642	708	607	329	401		302	490	----	623	658	458	761	572	----	685	621	534		366	502	532	692	728	477	692	661		547	440		418	662
July 24-------	348	673		681	540	626	594	(675)	227	685	585		350	605	----	676	696	725	802	543	619	583	686	610		519	642	354	410	698	586	723	675		640	534		343	590
July 25-------	583	442		670	720	662	670	734	259	553	740		394	372	----	560	542	676	669	467	660	474	478	704		691	587	536	249	719	683	679	701		553	670		515	713
July 26-------	351	301		619	362	639	661	737	571	693	703		675	631	----	633	654	670	617	525	454	233	601	628		(612)	568	662	533	734	618	----	722		527	663		629	306
July 27-------	460	634		617	233	614	631	723	636	607	608		463	639	----	658	624	457	605	602	451	520	689	643		615	536	668	681	705	499	----	720		329	(637)		635	662
July 28-------	253	396		440	628	170	657	740	726	629	152		228	270	----	658	729	395	646	175	620	347	668	621		75	84	268	508	524	345	----	581		428	(107)		477	642
July 29-------	491	624		579	665	234	706	734	502	681	237		662	589	----	469	706	720	647	635	665	----	565	701		(454)	480	294	527	726	497	----	634		641	266		(458)	481
Averages------	422	537		605	510	478	652	(722)	504	597	489		439	514	----	611	658	586	678	503	578	474	615	635		(476)	485	473	514	691	530	----	671		529	(474)		(497)	579
Departures----	-115	-115		+53	----	----	+125	+2	----	+97	-17		+14	+6	----	+1	+14	+15	+24	-53	-1	-104	----	-12		-2	----	-23	-2	+51	+25	----	----		+36	+14		----	+12

Accumulated Departures January 1 to July 29, 1951

	Lake Charles, La.	Las Vegas, Nev.	Lexington, Ky.	Lincoln, Nebr.	Little Rock, Ark.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Miami, Fla.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T.H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S.D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste.Marie, Mich.	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle (U. of W.), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W.I.	Thule, Greenland	Toronto, Ont.	Upton, N.Y.	Wake Island, Pac.Area	Washington, D.C.	Winnipeg, Manitoba
	+924	-1120		-6321	----	----	-3633	+2303	----	+4690	+784		----	+599	----	+4452	----	----	----	+2282	-182	+581	----	-1561		-511	----	+483	----	+364	-189	----	----		-1582	+1799		----	----

Note--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

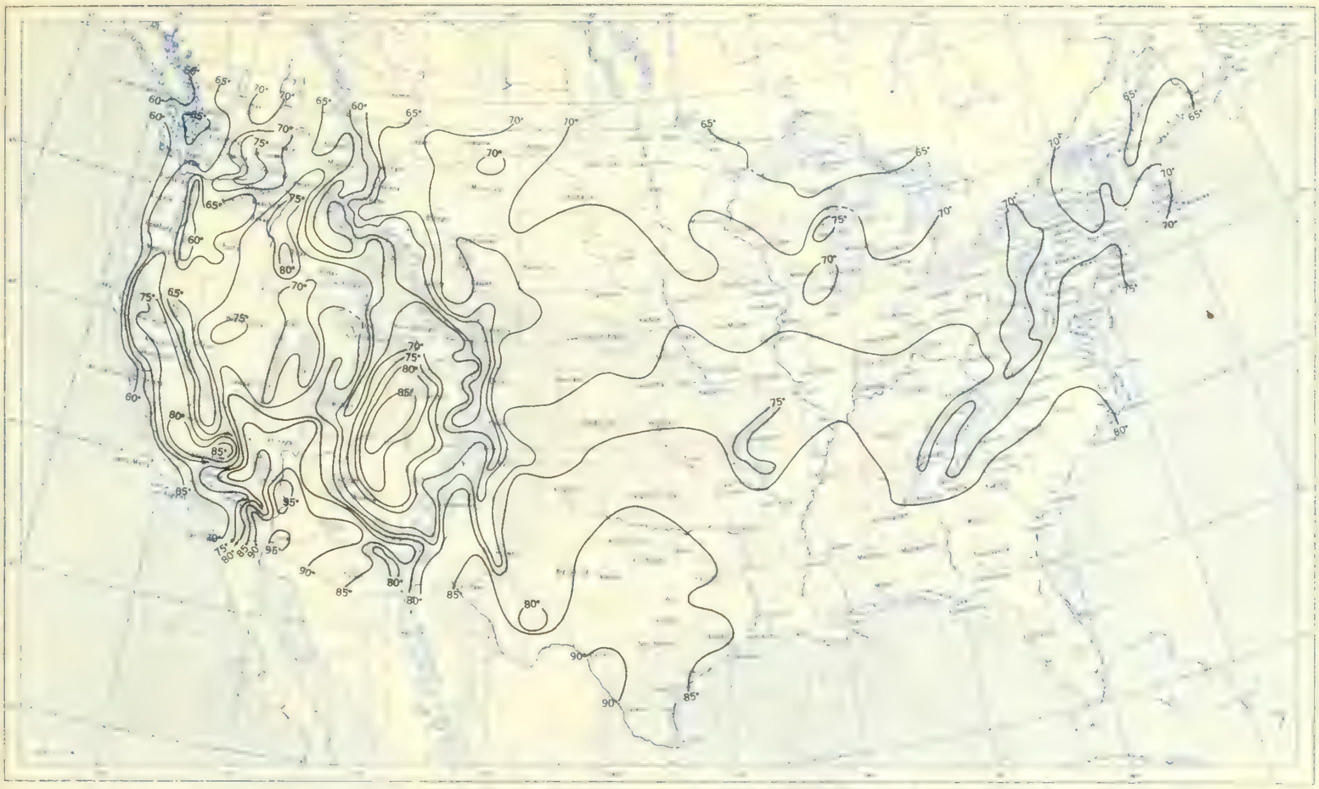
Beginning with this issue, two new stations are being added to Table 33 and will appear regularly in future editions. They are Barrow, Alaska, and Grand Junction, Colorado. Following is a brief description of each:

1. Barrow, Alaska: Latitude 71° 18'N; longitude 156° 47'W; elevation approximately 9 meters. Equipment consists of one Eppley 10-junction and one Eppley 50-junction pyrheliometer and a Brown potentiometer. Exposure is excellent. Some atmospheric pollution caused by burning of peat moss by community inhabitants for heating purposes. This is a Weather Bureau station.

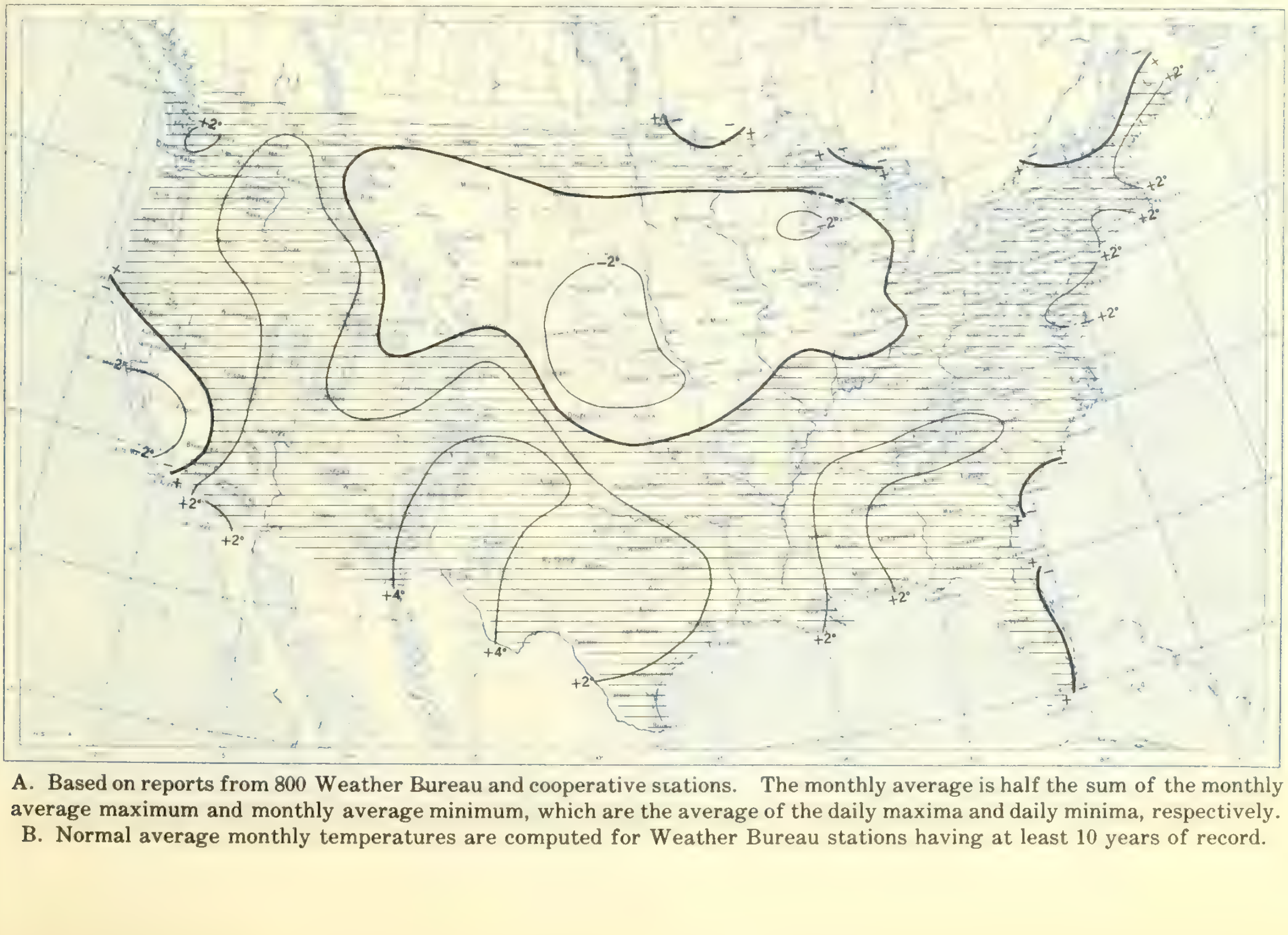
2. Grand Junction, Colorado: Latitude 39° 06' N; longitude 108° 32' W; elevation 1475 meters. Instruments include an Eppley pyrheliometer and Brown integrating potentiometer. Exposure is good except for some obstructions by antennae. A little atmospheric pollution caused by dust haze in the spring by nearby arid regions. This is a Weather Bureau station and instruments are located on west corner of roof of Weather Bureau Office.

W. B. T. U., New Orleans, La.- 12/7/51 - 2200

Chart I. A. Average Temperature (°F.) at Surface, July 1951.

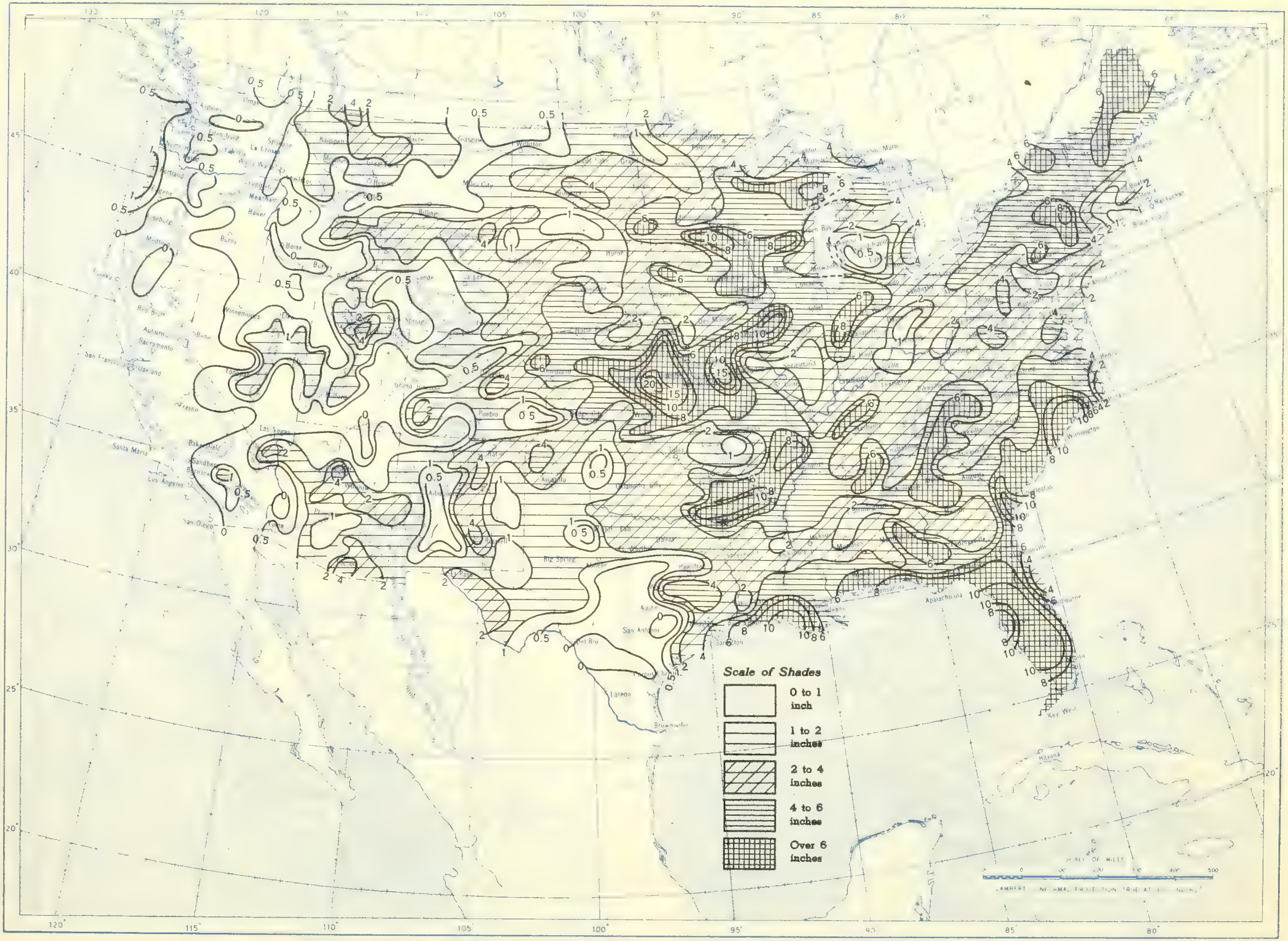


B. Departure of Average Temperature from Normal (°F.), July 1951.



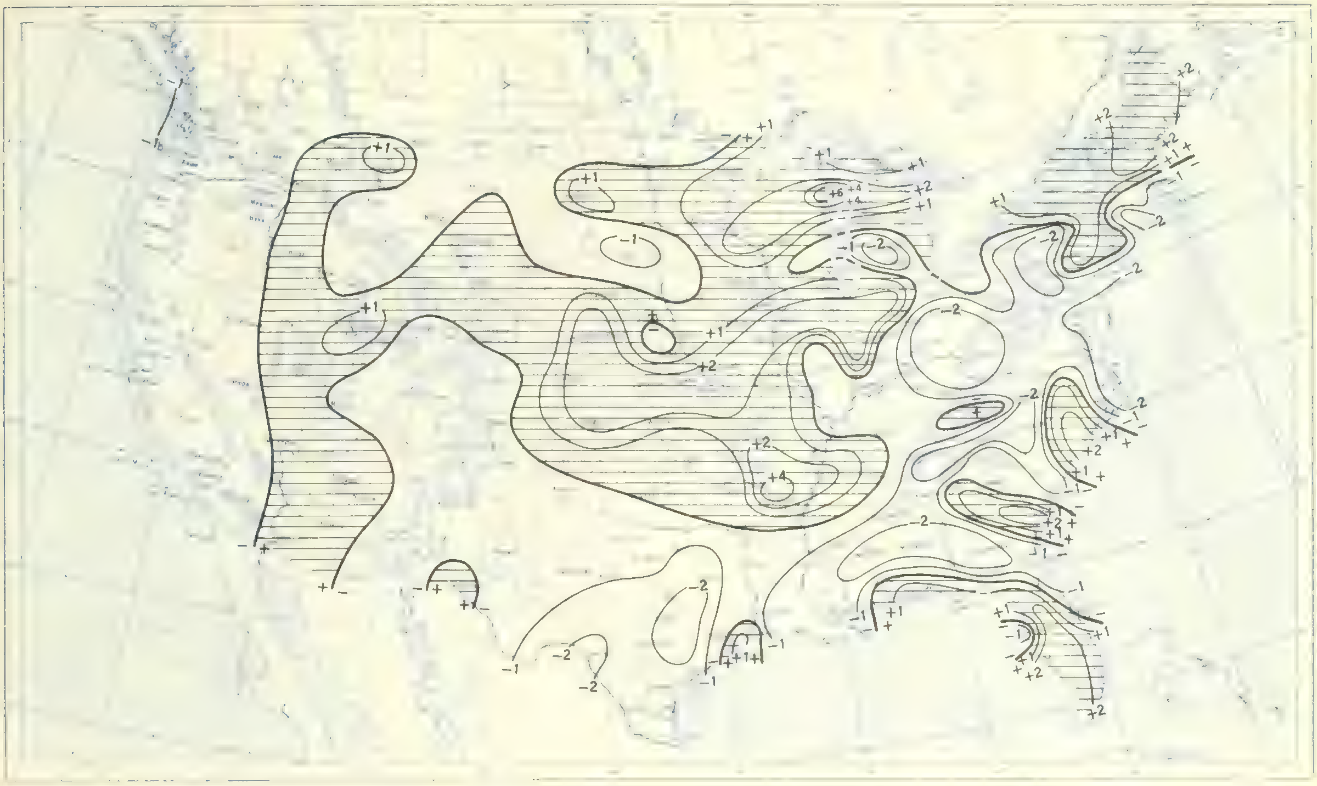
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), July 1951.

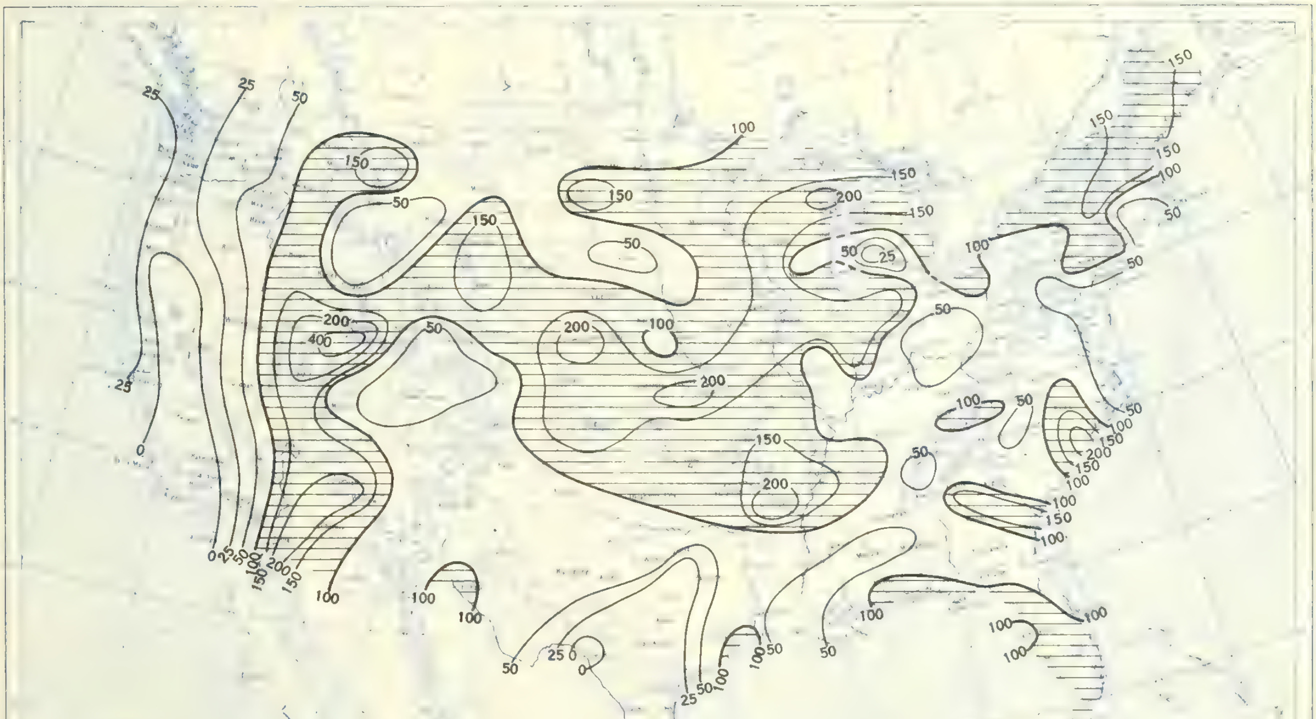


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), July 1951.

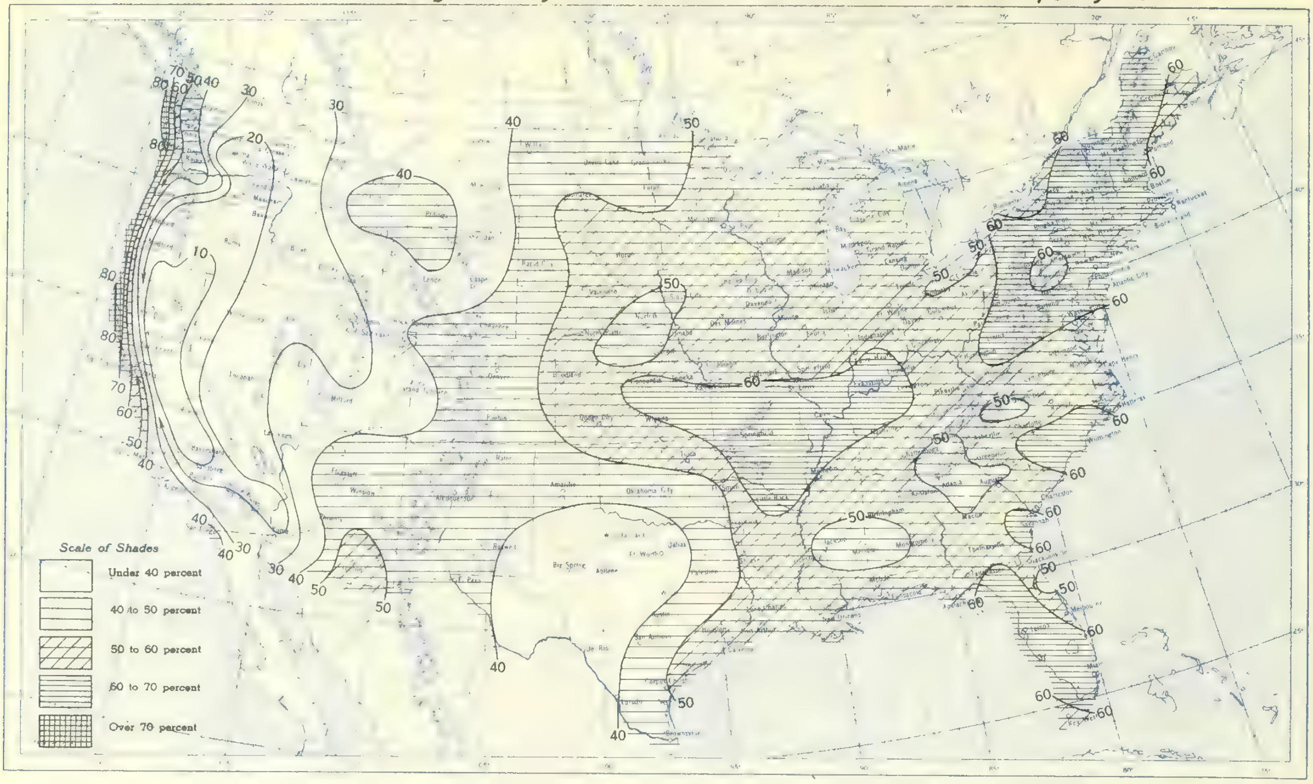


B. Percentage of Normal Precipitation, July 1951.

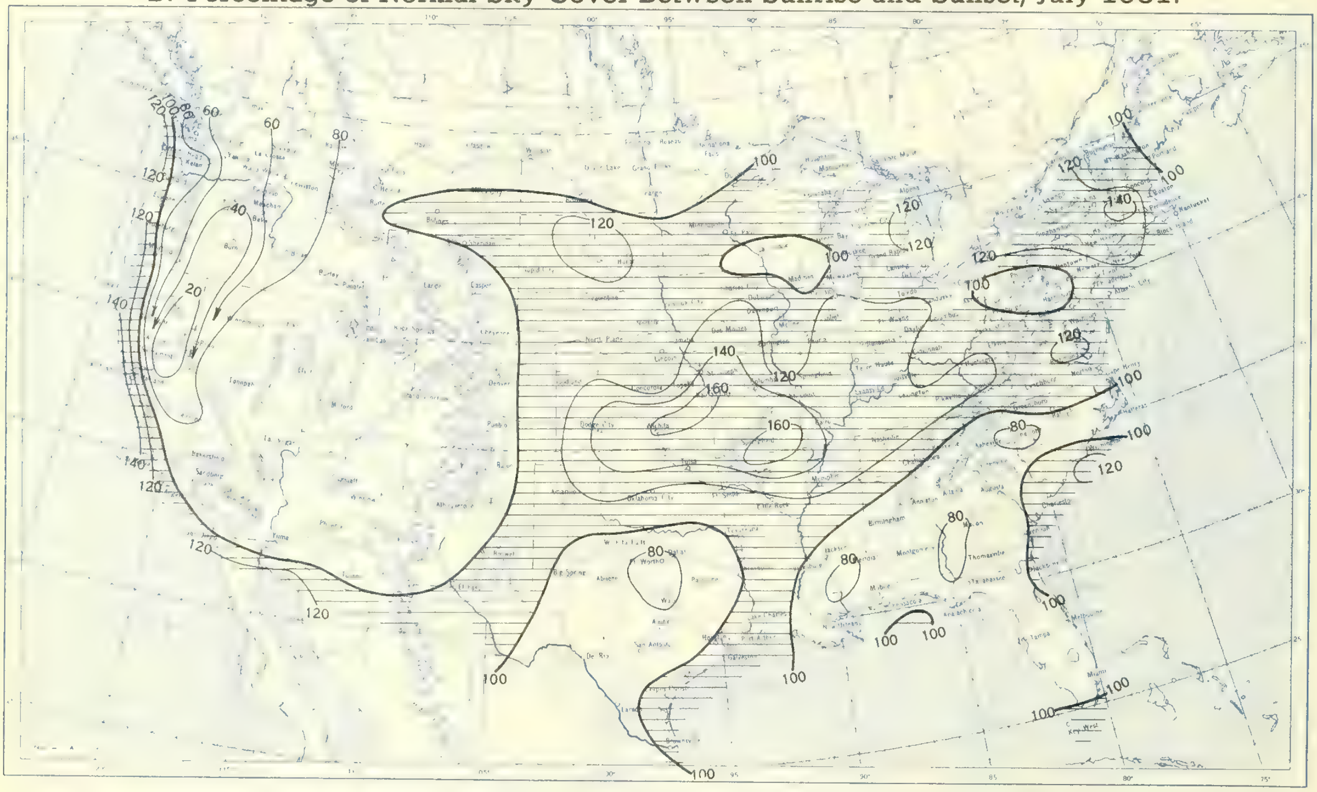


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, July 1951.

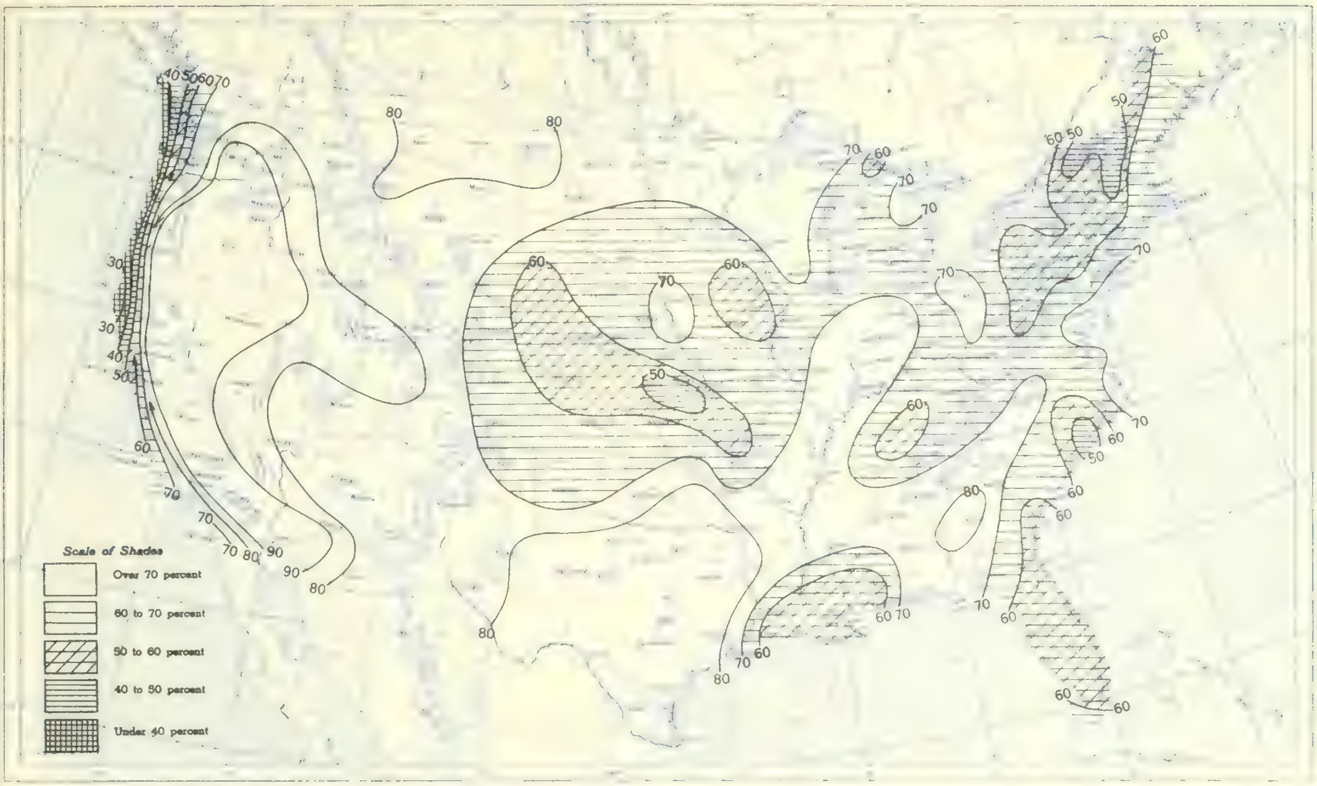


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, July 1951.

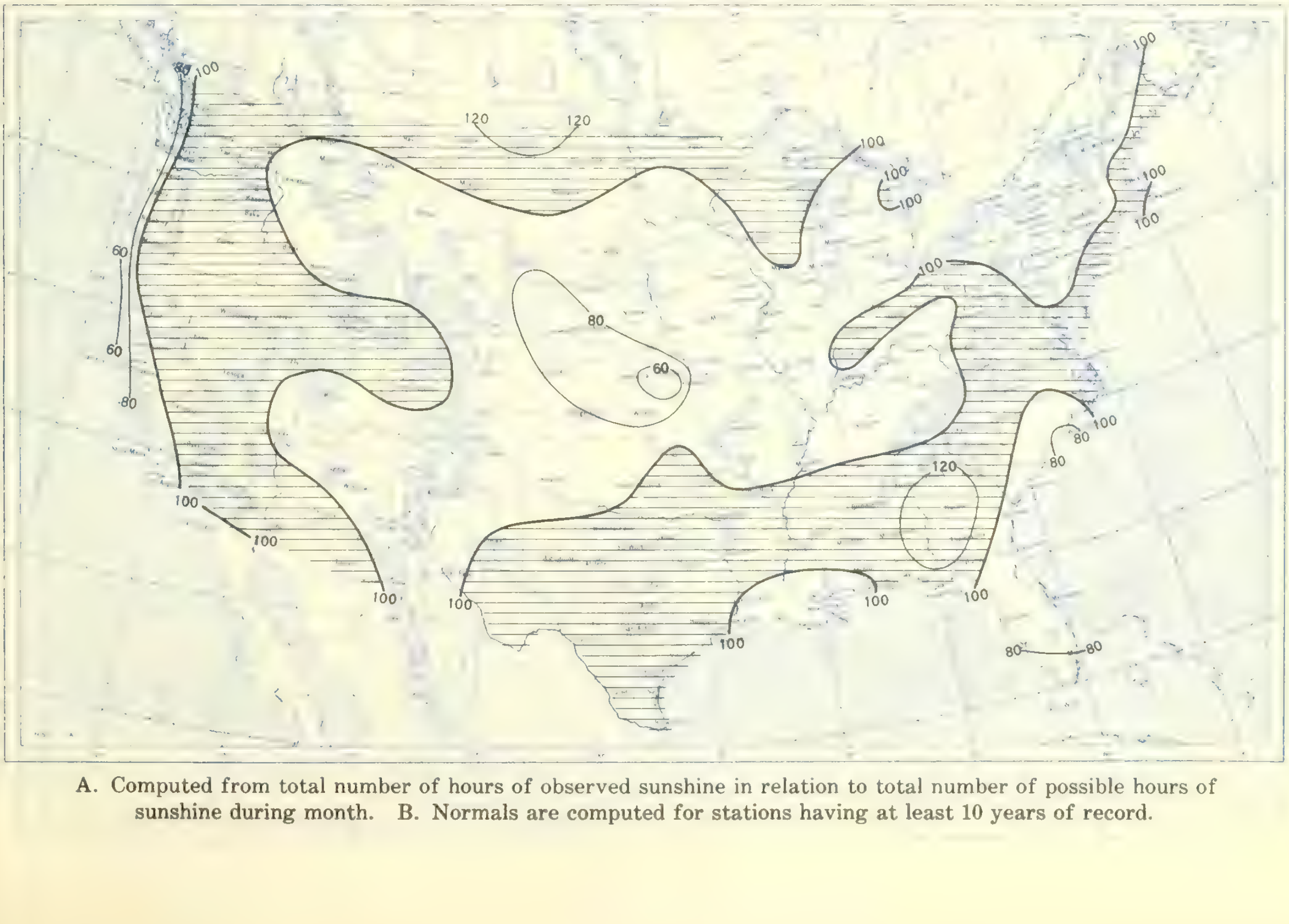


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, July 1951.



B. Percentage of Normal Sunshine, July 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, July 1951. Inset: Percentage of Normal Average Daily Solar Radiation, July 1951.

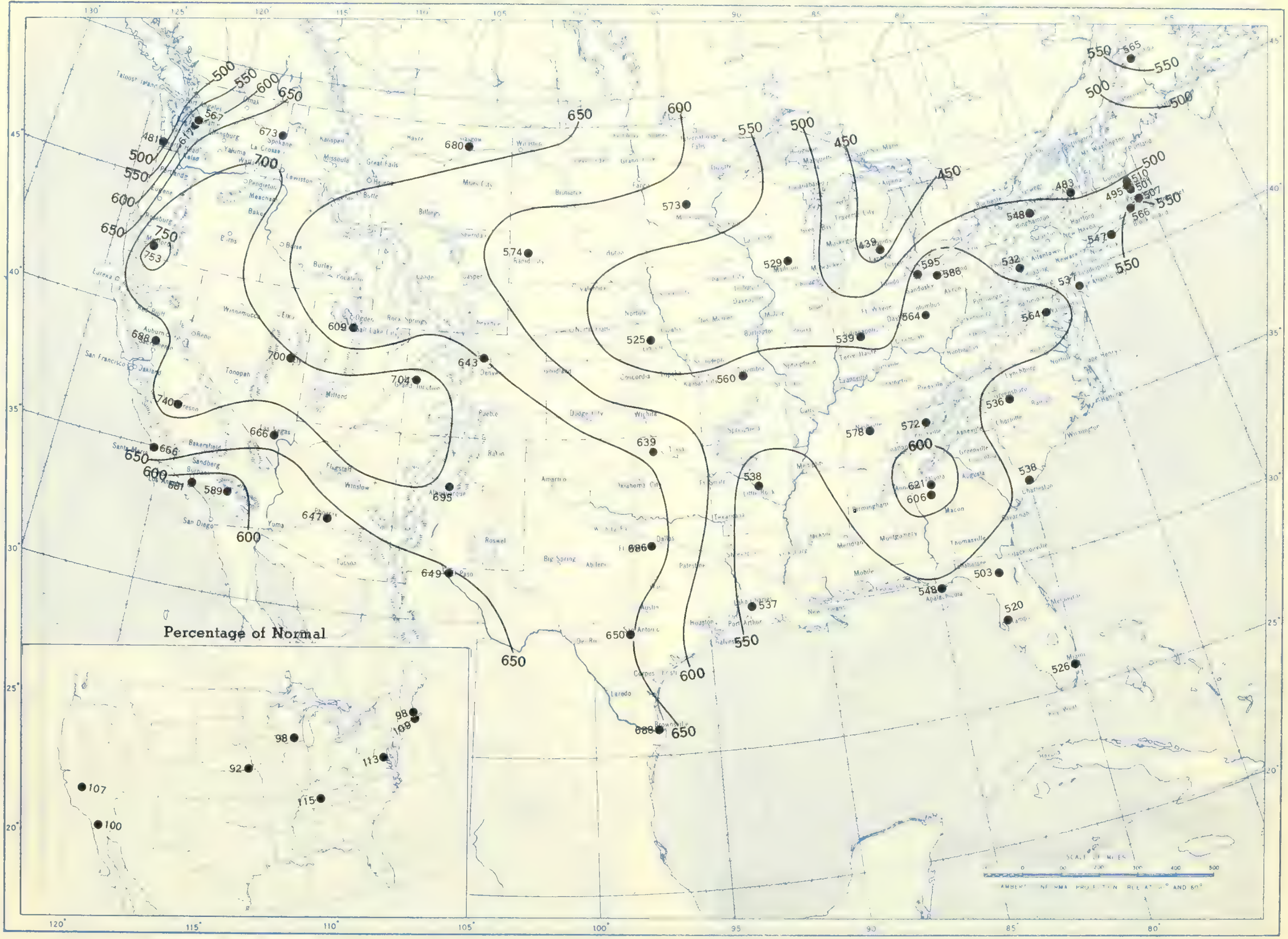
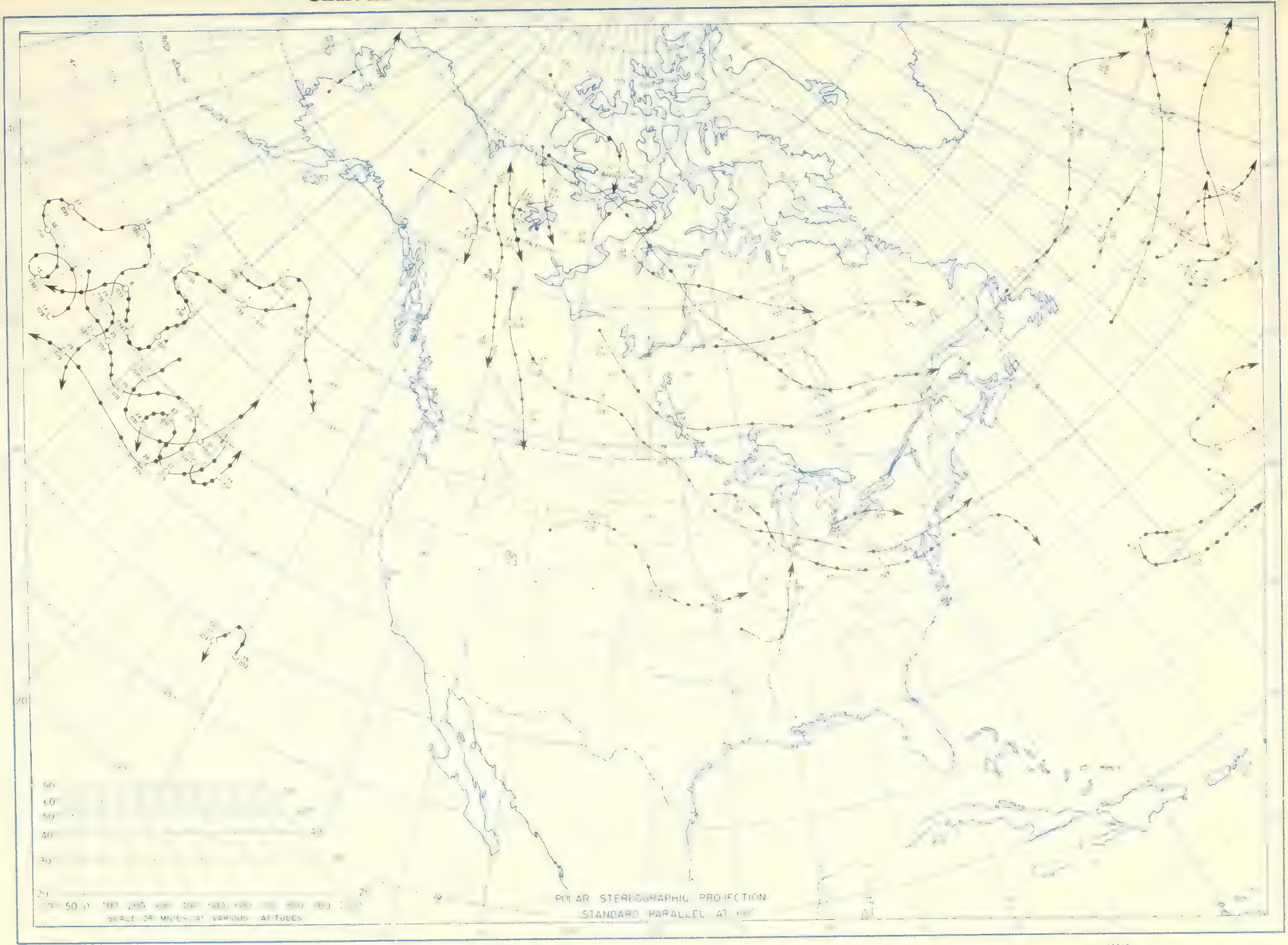


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines

… are wider than for those data shown. Normals are

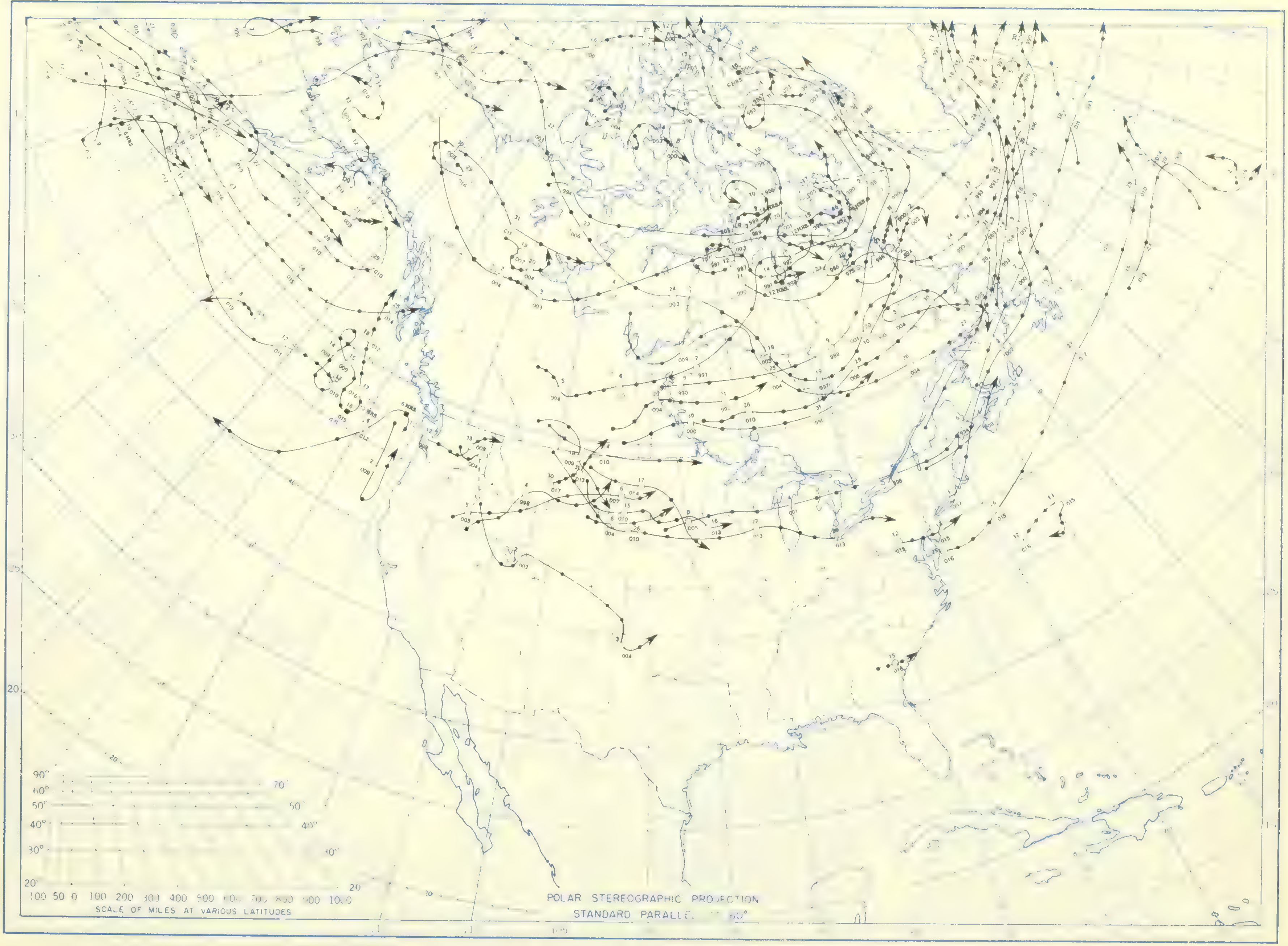
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines

Chart IX. Tracks of Centers of Anticyclones at Sea Level, July 1951


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES

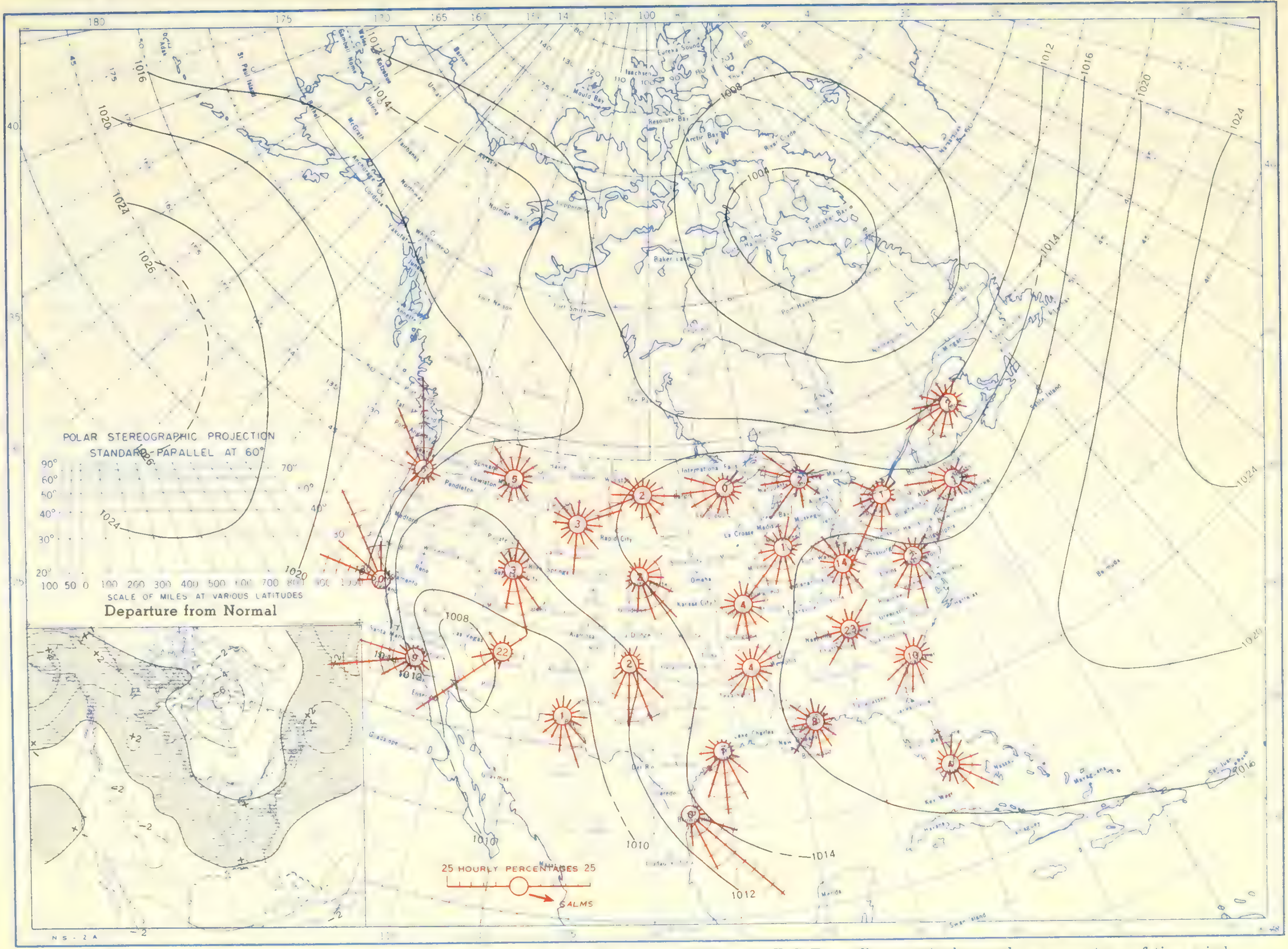
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, July 1951.



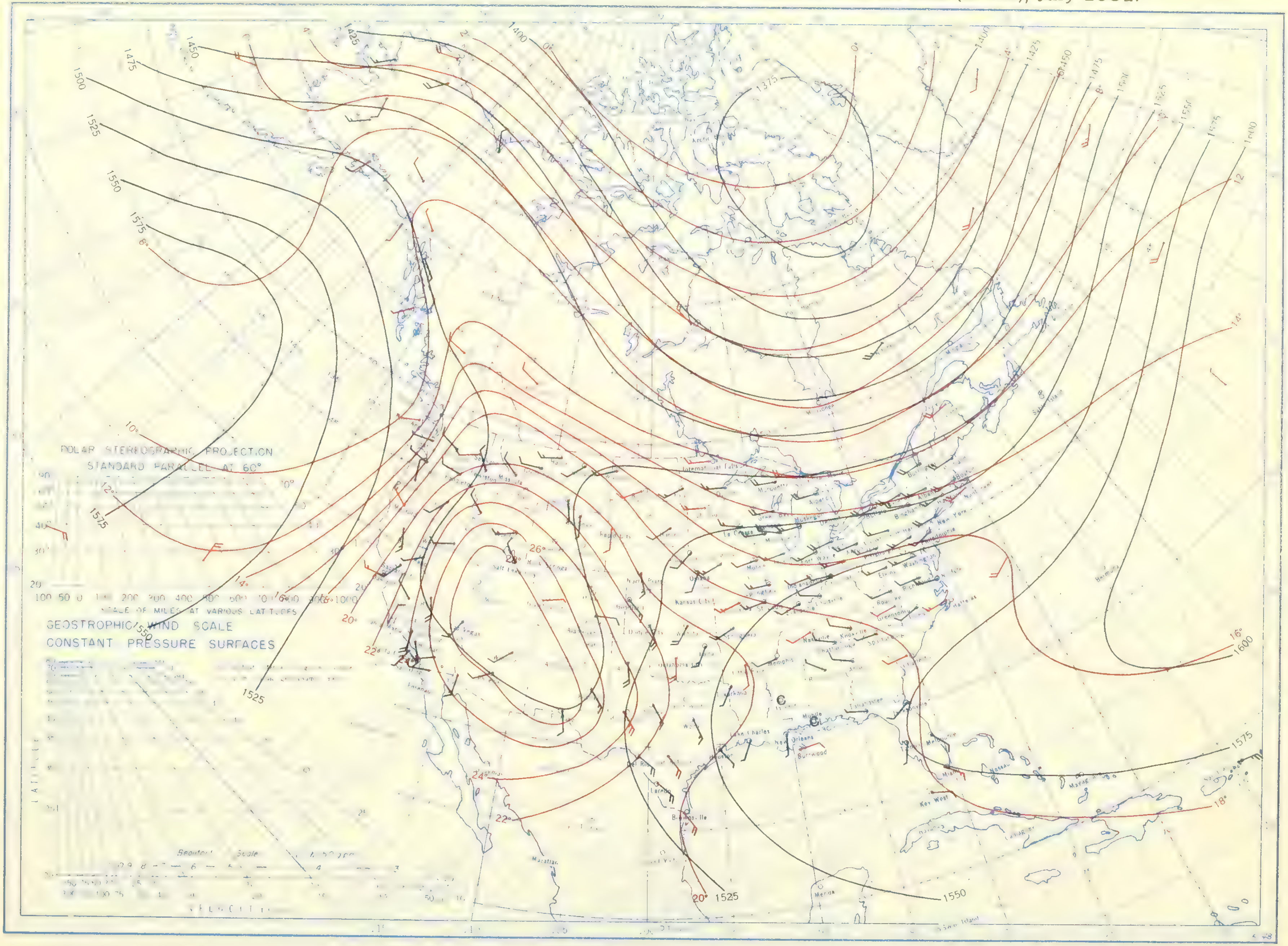
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Average Pressure (mb.) from Normal, July 1951.



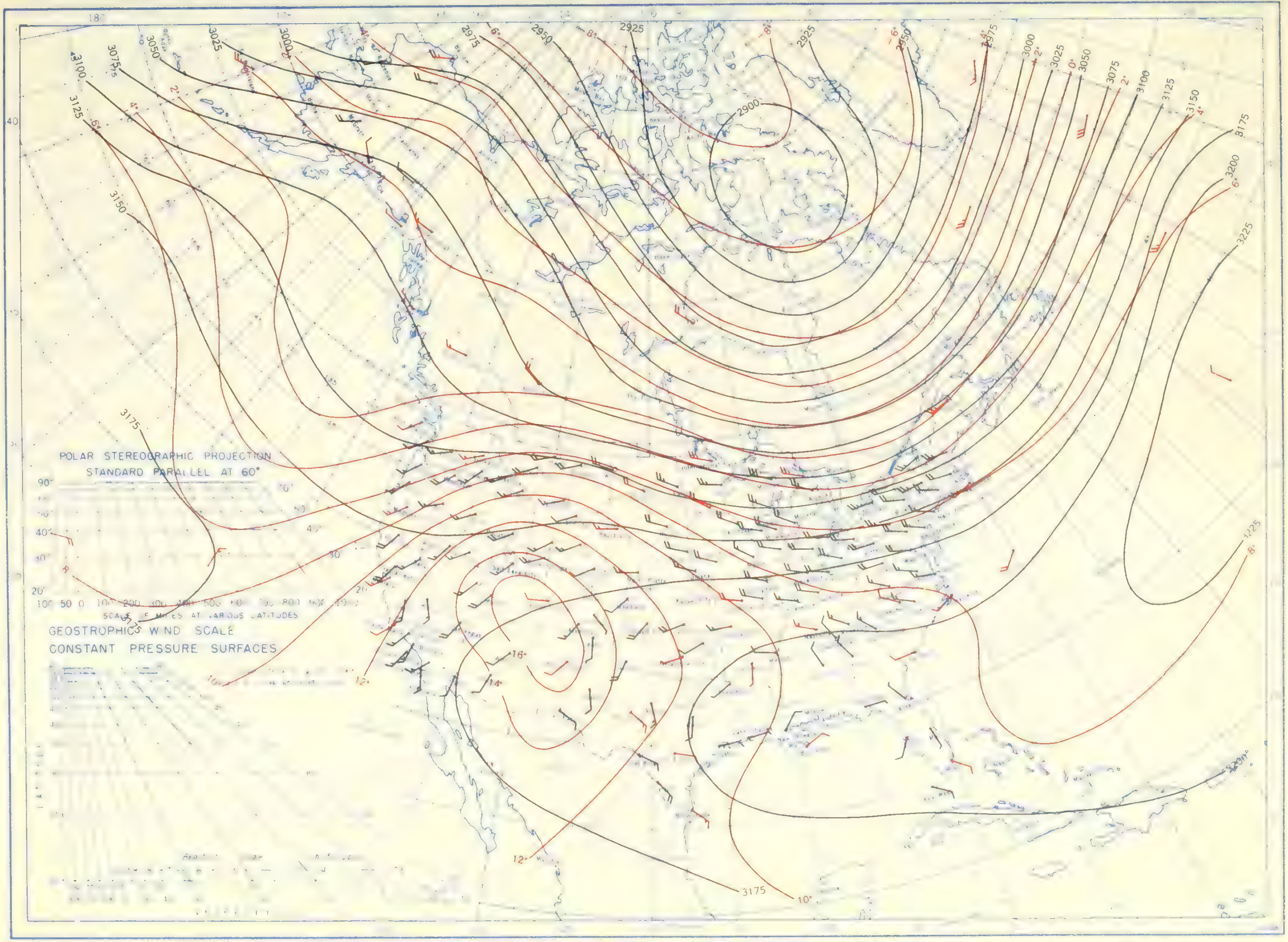
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899 1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), July 1951.



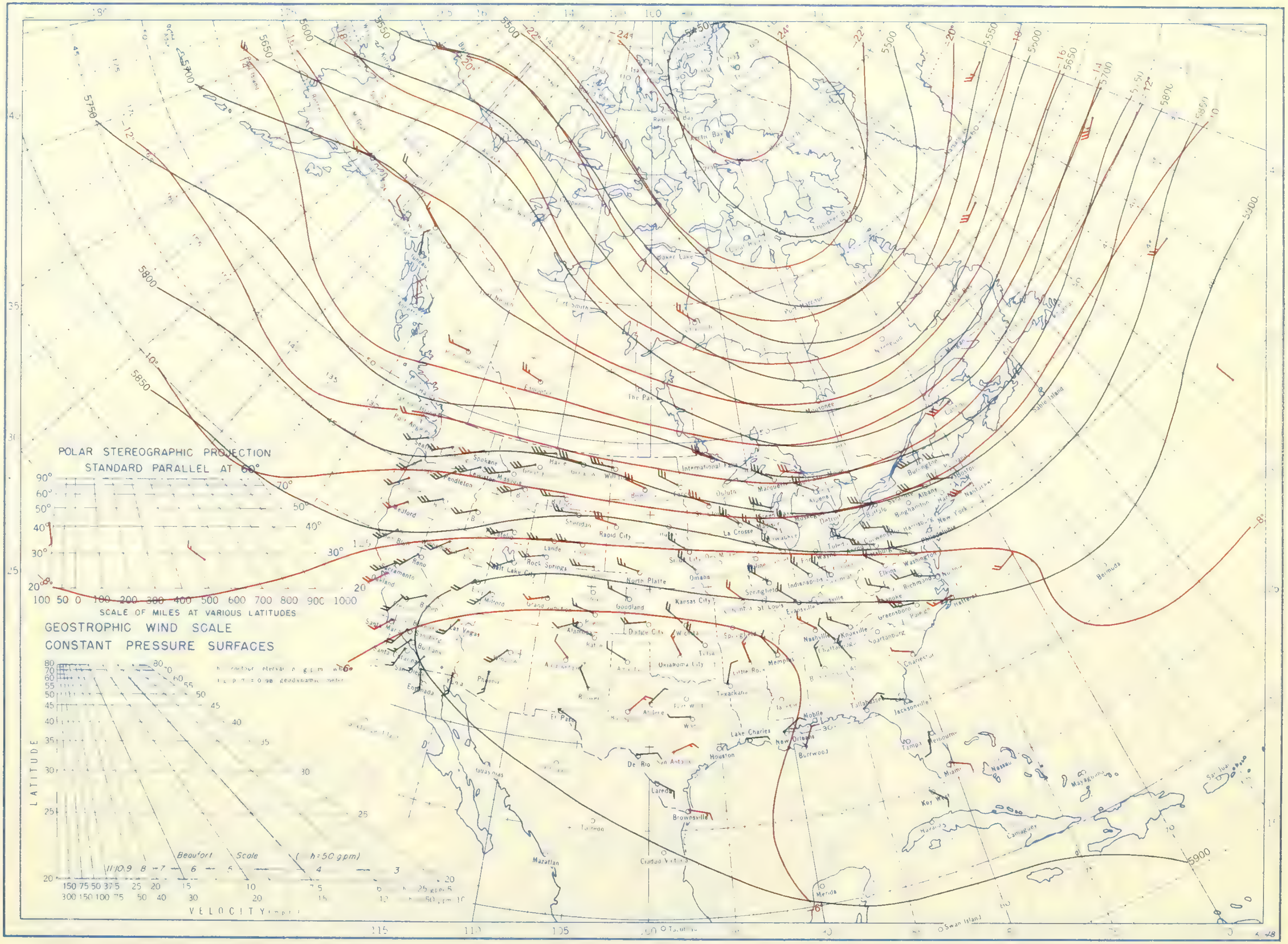
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), July 1951.



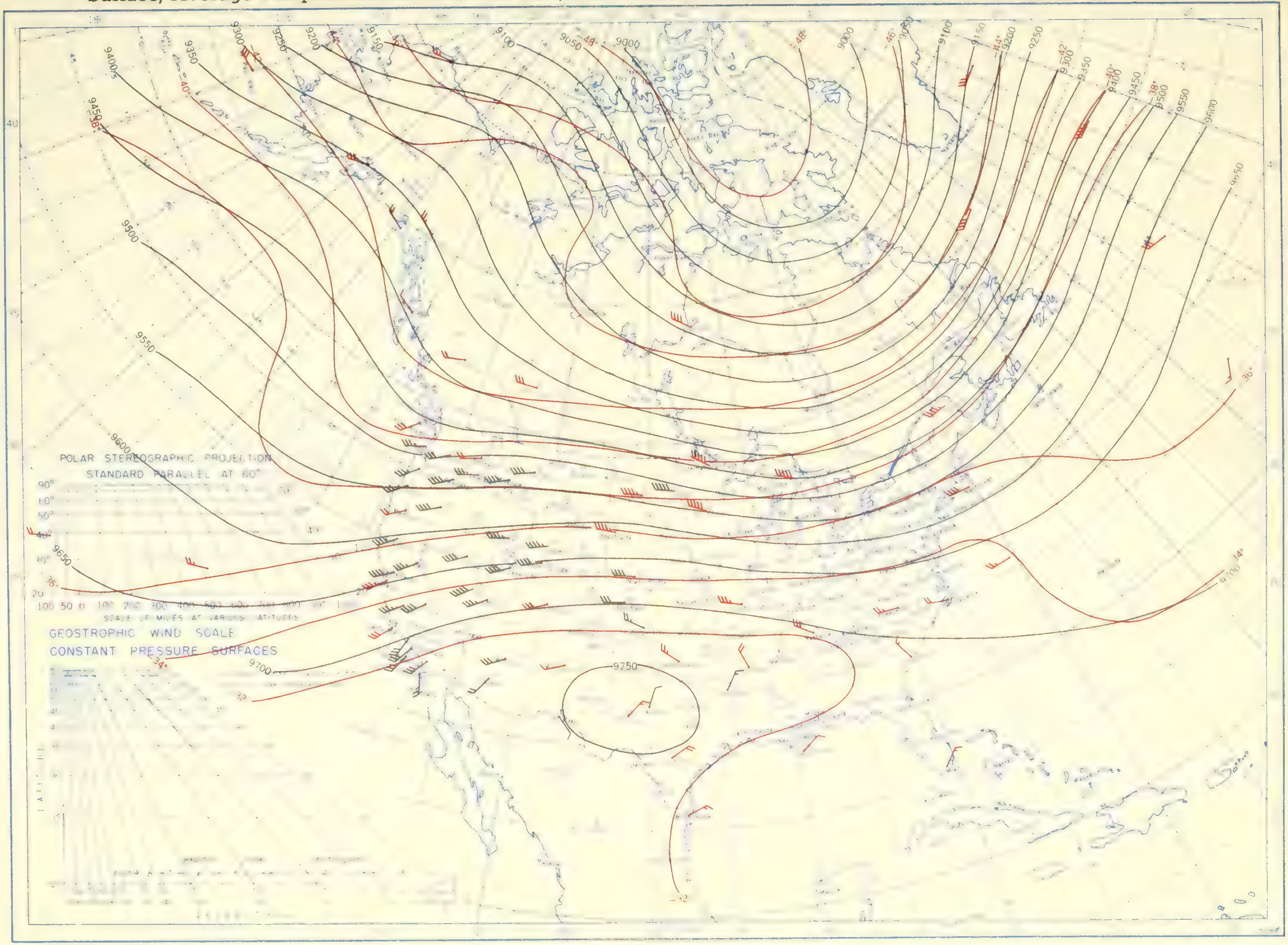
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), July 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), July 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

AUGUST 1951
Volume 2 No. 8

NEW ORLEANS: 1951

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions———— 245

Condensed Climatological Data - States———— 247

Climatological Data - Stations———— 248

Heating Degree Days———— 253

Severe Storms———— 254

General Summary of River and Flood Conditions———— 269

Flood Stage Data———— 270

UPPER AIR DATA

Radiosonde Data———— 271

Pilot Balloon Data———— 274

Rawin Data———— 275

SOLAR RADIATION DATA

Solar Radiation Intensities———— 276

Blue Hill Data———— 277

Daily Totals and Average Daily Totals by Weeks———— 278

CHARTS I-XV

NOTE.—This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 8

AUGUST 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

On a Nation-wide basis the temperature for August 1951 averaged 72.8°, or about normal. Chart 1B shows generally large plus departures in the Gulf States, ranging up to 7° or more in northern Texas, and rather large minus departures in much of Montana, the extreme upper Mississippi Valley, and the western portion of the Lake Region. Departures were not unusual elsewhere.

Extremes of temperature for the month were not unusual and only a few records were set. The highest temperature for the month was 121° at Cow Creek and Greenland Ranch in Death Valley, California, on the 17th and 19th, respectively, and the lowest 15° at Fremont, Oregon, on the 30th. All States recorded maxima for the month in excess of 100° except Minnesota, Wisconsin, Michigan, and several northeastern States. Rhode Island, however, recorded a high of only 89°. In general extreme highest temperatures occurred in the Great Plains and far West, and east of the Appalachians during the first week, and from the Mississippi Valley to the Appalachians at the end of the month. Lowest temperatures for the month occurred in most sections of the northeastern quarter of the country on the 4th and 5th, and in the Southeast and many western sections during the last week. Lowest temperatures reached the freezing point or below in New Hampshire, New York, Pennsylvania, and West Virginia in the East, Michigan and Wisconsin in the Lake Region, and in South Dakota and in all the western States.

This August was one of the hottest ever experienced in the Gulf States. Average temperature values were the highest of record for Alabama, Louisiana, and the eastern half of Texas, Florida's average temperature equaled the highest of record, and averages for Mississippi and Georgia were near records. Extreme high temperatures set few records, although maxima were high throughout the month. The highest temperature recorded in this area was 116° at Henrietta, Tex. on the 6th, but this was 4° short of the record 120° recorded for this State in August 1936. At Fort Worth, Tex. the maximum temperature exceeded 100° on 24 days during the month. Maximum temperatures reached 90° or higher at nearly all stations in Louisiana on 30 or 31 days, and at all stations in Georgia on 20 to 25 days. In Oklahoma, Arkansas, Tennessee, and the Carolinas state-wide monthly average temperatures were much above normal, but the heat was tempered by brief periods of near normal temperatures.

The month was cooler than normal in north-central areas most of the month, although average monthly temperatures were generally slightly higher than in August 1950. Sunshine was generally below normal in these areas, and periods of unusually low temperatures were near the beginning of the month and about the middle of the last decade. From the 3d to the 6th temperatures fell to freezing at scattered stations, and light frost occurred at a few places in Wisconsin and Pennsylvania. Minimum temperatures fell to near record levels at a few stations in south-central New Hampshire on the 6th.

On a Nation-wide basis precipitation averaged 2.57 inches which is about normal. Monthly totals were above normal in much of the north-central interior, in the Rocky Mountain Region as far west as the 115th meridian, and in scattered areas along the Atlantic Coast including Maine. Monthly totals were more than 200 percent of normal at many stations in the Missouri Valley. Miles City, Mont. reported 370 percent of normal rainfall; Bismarck, N. Dak., 269; Sioux City, Iowa, 248; and St. Joseph, Mo., 257 percent. In Montana this was the second wettest August on record.

Record monthly totals of rainfall for August were recorded in northern Utah, central Arizona, and extreme southern California, with some stations recording record 24-hour amounts for August. In Utah, Ogden Airport measured 3.36 inches on the 4th, one of the greatest 24-hour amounts ever recorded in the State during August, and on the same date 1.66 inches ever recorded at Salt Lake City established a new 24-hour August record for that city. These heavy rains caused numerous flash floods in the canyons along the western slopes of the Wasatch Mountains.

The average precipitation for Arizona was 4.14 inches, the greatest amount for any month in that State since 1921, and the greatest for August since 1909. A few stations in Arizona, including Ajo, Crown King, and Walnut Grove, measured their greatest amounts of record for any month. Also all-time 24-hour records were set at Crown King, Reno, R. S., and Sierra Ancha, Ariz., with 5.31, 3.99, and 4.58 inches respectively during the storm from the 26th to the 30th. For the 5-day period storm totals were 13.56 inches at Crown King and 11.87 inches at Castle Hot Springs. Crown King, Ariz., also measured the country's highest monthly total 16.95 inches.

This same storm also caused especially heavy rains in southern California. The month's total at San Diego of 0.85 inch was the fourth greatest August total at that station since 1850. Blyth measured a monthly total of 6.00 inches which was the greatest total for any month during a 42-year record. August record totals were recorded at Brawley, El Centro, Iron Mountain, and Parker Reser during the same storm that brought heavy rains to Arizona.

In many sections of the far West, in sections along the Atlantic Coast, and in the South, the month was extremely dry. Droughty conditions which began early in the summer continued in many areas until the last few days of the month. The month's rainfall was insufficient in much of Nevada, with wells in the Las Vegas Valley at the lowest levels on record, and high fire hazard prevailing most of the month. In some sections of the South stream flow was the lowest of record, and some crops were cut short by the combination of drought and excessive heat. This was the driest August on record in Louisiana, and the second driest in Mississippi. In many sections of the Atlantic Coastal States, the Appalachian Region, and the Ohio Valley monthly totals of rainfall were less than 50 percent of normal. In central and southern Ohio and northern West Virginia many stations recorded less than one-fourth their normal August rainfall. In central and southern Ohio corn and soybean crops were cut from 10 to 25 percent.

A hurricane that caused great destruction on the Island of Jamaica on the 17th and 18th moved westward across the Gulf of Mexico and finally moved inland a short distance north of Tampico, Mexico, on the 22d. This hurricane caused 4.39 inches of rain at Brownsville, Texas, on the 22d, and crossing northern Mexico brought a flow of moist air into the southwestern desert areas that resulted in heavy rains in that area from the 26th to the 30th.

Sunshine was below normal in north-central and western sections, particularly in north-central sections where some stations recorded record low amounts. The percentage of normal sunshine at Minneapolis, Minn. was the least for any August since records began in 1914.

Relative humidity was higher than normal in north-central and far western areas, and along the north Atlantic Coast, but below in the South Atlantic States, Texas and Oklahoma, the areas of excessive heat and abundant sunshine.

Sea level pressure generally averaged below normal, with only stations in the Southwest, the lower Rio Grande Valley, and in the upper Mississippi Valley being above.

Sunshine was generally below normal in north-central and most far western areas, and in some northeastern sections, but was abundant in the South, Oklahoma, and Texas. The greatest sunshine deficiency occurred in extreme north-central areas. Minneapolis, Minn., recorded the least amounts of sunshine for any August since sunshine records began in 1914 at that station.

Of the severe local storms which occurred during the month the most destructive was a combination of wind and hail in the vicinity of Dean, Tex. on the 10th that destroyed 10,000 to 12,000 acres of cotton valued at $1,500,000. Hail was frequent in the central and northern Rockies and northern Great Plains. These storms caused about $1,400,000 damage in Nebraska. Denver, Colo., was visited by a hailstorm on the 31st that caused $150,000 damage, and by heavy rain on the 1st that resulted in a flash flood loss estimated at $525,000. Flash floods also caused considerable damage in Utah, New Mexico, Arizona, and southern California. A thunderstorm with winds of 80 m.p.h. occurred at New Orleans, La., on the 16th, resulting in $250,000 damage. Tornadoes were much more frequent than usual, with 31 reported which may be compared to the normal frequency of 8 for August. Twelve tornadoes occurred in Kansas, 3 in Arizona, 3 in Michigan, and 4 in New England.

The hot, dry weather in the South was favorable for harvesting cotton, and for checking weevil, but there was some premature opening of bolls in the drier sections. The weather was unfavorable for the development of corn in most of the Main Belt, and at the end of the month a considerable acreage was not expected to mature before the average date of killing frost. Damp weather also interfered with grain harvesting in the northern Rockies and northern Great Plains, but elsewhere the weather was mostly favorable for this operation. Irrigated crops in the far West thrived, but drought conditions dimmed the prospects for some dryland crops like pastures.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

Section	Temperature								Precipitation					
			Monthly extremes								Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F.	°F.		°F.			°F		In.	In.		In.		In.
Alabama	82.9	+3.2	4 Stations	106	*30	2 Stations	56	24	2.42	-2.27	Fairhope	7.04	Shoemaker Springs	0.11
Arizona	77.3	-1.0	2 Stations	114	*1	Fort Valley	30	31	4.14	+2.03	Crown King	16.95	Dinnehotso	.64
Arkansas	81.5	+1.5	Arkadelphia	109	31	Turnpike	50	24	2.75	-.84	Sugar Loaf Mountain	9.35	2 Stations	.18
California	73.7	-1.1	2 Stations	121	*17	Boca	22	12	.39	+.22	Blythe	6.00	243 Stations	.00
Colorado	66.1	+.2	Eversoll Ranch	104	*6	Fraser	21	15	2.41	+.50	Boulder 2	8.59	Olathe	.34
Connecticut	69.1	+1.8	2 Stations	93	*1	2 Stations	41	6	4.27	+.18	Thompsonville	7.21	Candlewood Lake	1.83
Delaware	74.0	-.4	Clayton	98	13	Newark Col. Farm	46	5	3.13	-1.65	Millsboro	6.60	Wilmington Porter R.	1.35
Florida	83.3	+1.9	Pensacola CAA AP	103	30	Jasper 10E	58	26	5.50	-1.58	Bradenton	12.85	Cedar Key	.60
Georgia	81.8	+2.0	2 Stations	103	*9	Carrollton	51	*20	3.01	-2.26	Savannah WB AP	9.69	Athens WB AP	.09
Idaho	65.4	-1.2	Riggins RS	109	2	Obsidian 4NNE	19	31	1.37	+.79	Ashton 1S	4.89	Boise Lucky Pk Dam	.00
Illinois	73.0	-1.6	Harrisburg	103	31	2 Stations	42	*4	3.71	+.35	Moline WB AP	8.00	Albion	1.15
Indiana	72.1	-1.6	Tell City Power Pl	104	31	Salamonia	39	24	2.60	-.72	Valparaiso Water Wks	7.35	Alpine	.51
Iowa	70.5	-2.1	3 Stations	98	*6	Ida Grove	41	22	6.21	+2.45	Ida Grove	14.85	Morse 1NE	3.02
Kansas	77.9	-.4	2 Stations	108	*6	Troy	47	15	4.30	+1.19	Highland 1W	11.05	Bird City 11S	.60
Kentucky	76.0	+.2	do	103	31	Grayson	39	25	3.17	-.54	Flemingsburg P.O.	7.37	Hicksville	.68
Louisiana	85.1	+3.3	3 Stations	109	*17	Colfax	57	25	1.95	-2.91	Schriever	6.72	Riverton Dam	.00
Maine	65.0	-.2	Dead River 6N	90	13	4 Stations	38	*5	4.15	+.91	Jackman	6.72	Portland WB AP	2.48
Maryland	73.6	+.2	Keedysville	100	10	2 Stations	36	*24	2.30	-2.11	Solomons	5.95	Conowingo Dam	.15
Massachusetts	68.2	-.4	2 Stations	93	*1	Birch Hill Dam	35	*6	3.76	+.13	Edgartown	9.82	Middleton	1.73
Michigan	64.3	-2.8	Monroe Water Wks	99	31	Kenton U.S. Forest	30	4	3.86	+.93	Calumet CAA AP	9.06	Grand Ledge	1.05
Minnesota	64.5	-2.7	3 Stations	95	*1	Cloquet Forest Exp.	34	4	5.15	+1.87	Island Lake Res.	9.66	Minneapolis WB AP	1.94
Mississippi	83.9	+3.1	Moorhead	108	31	3 Stations	55	24	1.85	-2.27	Pearlington	6.21	Acona	T
Missouri	76.2	-.3	Monett	105	31	2 Stations	48	*5	5.14	+1.36	2 Stations	10.99	Fisk	.05
Montana	63.2	-2.4	Big Sandy	106	3	Wisdom	22	31	2.44	+1.32	Babb 6NE	5.94	Grant	.27
Nebraska	72.4	-1.2	Pawnee City	105	6	Ft. Robinson	[illegible]	15	4.26	+1.58	Ewing 12S	10.79	Henry 6N	.31
Nevada	69.9	-1.6	No. Las Vegas Doxarm	114	14	2 Stations	26	*25	.56	+.06	Sheldon	2.58	5 Stations	.00
New Hampshire	64.7	-.9	5 Stations	90	*11	Fabyan	31	6	3.79	+.29	Walpole	6.07	West Alton	2.20
New Jersey	72.3	+.3	2 Stations	96	*1	Layton 3NW	38	5	3.03	-1.64	Ringwood	8.43	Lumberton	.90
New Mexico	73.1	+1.4	Jal	108	[illegible]	Eagle Nest	30	9	2.30	-.08	Edgewood	7.34	Tucumcari	.05
New York	66.3	-1.4	Freedonia	98	31	2 Stations	32	*5	2.55	-1.13	Bakers Mills	8.66	Dunkirk CAA AP	.46
North Carolina	77.2	+1.3	Wilson	103	8	4 Stations	42	*24	3.72	-1.76	Clinton	11.72	Celo TVA	.16
North Dakota	63.8	-3.2	2 Stations	101	1	Wishek	35	11	4.09	+2.02	Arvilla State Park	9.19	2 Stations	1.29
Ohio	71.0	-.6	Napoleon	106	31	Norwalk	35	25	1.30	-2.03	Ironton	5.01	Coshocton	.08
Oklahoma	84.5	+2.6	2 Stations	115	6	Kenton	52	11	1.63	-1.29	Britton	5.33	Atoka	T
Oregon	65.0	-.6	Huntington	107	3	Fremont	15	30	.34	-.10	Willamette Snow Lab. 1	1.42	7 Stations	.00
Pennsylvania	69.5	-.8	9 Stations	96	*9	Philipsburg CAA AP	31	5	1.70	-2.39	Eagles Mere	6.34	Bruceton	.13
Rhode Island	70.0	+.8	Providence WB City	89	*29	Kingston	44	6	3.18	-.50	Austin	3.83	Providence WB AP	2.36
South Carolina	80.4	+.5	Little Mountain	105	9	3 Stations	56	*24	3.10	-2.59	Effingham	8.20	Crescent	.18
South Dakota	68.4	-2.7	Vale	105	*1	Deerfield Dam	28	*21	3.75	+1.64	Brookings	8.29	Edgemont	.64
Tennessee	78.6	+1.8	Palmetto	105	31	5 Stations	50	*24	2.00	-1.97	Ooltewah	8.12	McEwen 5S	T
Texas	85.2	+3.0	Henrietta	116	7	Midland	53	22	1.21	-1.14	Brownsville WB AP	6.11	28 Stations	.00
Utah	69.0	-.9	Moab	107	1	Woodruff	29	26	1.92	+.80	Cedar Breaks NM	4.63	Partoun	.21
Vermont	64.4	-1.0	Bellows Falls	92	31	Somerset	35	7	3.42	-.10	Springfield	6.52	Saint Albans	1.81
Virginia	74.3	+.3	2 Stations	100	*1	Burkes Garden	41	24	3.11	-1.33	Wallaceton Lk Drummond	10.31	Chantilly	.38
Washington	65.1	-.9	3 Stations	104	*2	Bumping Lake	29	*23	.94	+.23	2 Stations	3.82	2 Stations	T
West Virginia	71.0	-.8	Petersburg WB City	99	15	Cranberry Glades	28	25	2.75	-1.30	Clay	7.45	New Cumberland Dam 9	.20
Wisconsin	64.6	-2.8	Racine	91	31	Long Lake Dam	32	[illegible]	4.48	+1.04	Fennimore	11.56	Willard	1.93
Wyoming	63.3	-1.0	Morton 1NW	102	1	Bondurant	20	15	1.47	+.33	Grassy Lake Dam	5.19	Ten Sleep 26SSE	.00
Alaska (June)	49.6	-.1	Moses Point CAA	87	26	2 Stations	18	*8	1.95	+.31	Little Port Walter	15.94	Barrow WB AP	.05
Hawaii (July)	74.9	+.6	Puunene	97	23	Haleakala RS	42	13	4.47	-1.04	Kukui	36.00	3 Stations	.00
Puerto Rico	79.3	+.7	Utuado	98	20	Maricao Fish Hatchery	54	14	6.96	-.27	Maricao	18.68	Mona Island	1.20

* Other dates also.

Table 2

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days				Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy			
												Max. 90° F. or above	Min. 32° F. or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date						
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
ALABAMA																																	
Birmingham	610	991.5	1016.0	94	71	82.3	+3.8	100	31	65	24	30	0	69	70	2.98	-1.28	1.55	9	11	.0	0	7.2	NE	44	N	16	12	16	3	4.2	74	0
Mobile CO	10			95	77	86.1	+5.2	100	30	73	28	31	0	—	—	4.08	-2.84	2.70	5	12	.0	0	—	—	42	E	31	11	17	3	4.5	69	0
Mobile	211	1007.8	1015.6	95	74	84.6	—	102	30	70	*23	30	0	73	77	4.04	—	1.26	7	19	.0	0	7.5	W	—	—	—	—	—	—	4.6	—	0
Montgomery CO	201	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Montgomery	198	1008.1	1015.6	97	73	84.8	+4.0	102	29	64	*27	30	0	70	67	2.46	-1.77	1.93	4	10	.0	0	5.1	NE	43	SW	6	14	15	2	3.5	82	0
ARIZONA																																	
Flagstaff	6993	791.1	1017.4	77	48	62.6	—	86	15	37	25	0	0	46	61	5.50	—	2.65	8	11	.0	0	6.0	SW	—	—	—	15	8	8	4.3	—	91
Payson CO	5000	850.0	1014.1	88	58	73.3	—	99	16	47	30	19	0	54	58	10.38	—	3.49	12	13	T	0	4.1	NE	—	—	—	9	12	10	5.1	—	18
Phoenix CO	1083	—	—	99	76	87.9	-.6	108	16	65	30	27	0	—	—	5.33	+4.38	2.72	7	4	.0	0	6.3	—	35	SE	14	—	—	—	—	82	0
Phoenix	1108	971.2	1009.1	99	75	87.2	—	108	16	66	30	27	0	63	50	5.56	+4.61	2.91	6	3	.0	0	4.7	W	—	—	—	18	8	5	3.3	—	0
Prescott	5014	849.0	1013.2	86	58	71.6	—	97	18	46	31	11	0	48	51	3.83	—	1.54	9	14	.0	0	8.8	SW	33	SE	27	13	9	9	4.5	65	16
Tucson	2558	924.5	1009.9	97	73	84.9	+.7	104	12	63	31	26	0	59	46	2.66	+.32	1.20	9	10	.0	0	6.6	SE	45	E	15	15	8	8	4.5	79	0
Winslow	4880	852.7	1010.7	90	61	75.3	.0	98	13	49	30	19	0	47	43	1.79	-.05	1.11	9	8	.0	0	7.5	SW	*40	NW	15	14	9	8	4.4	—	4
Yuma	203	1003.4	1008.2	106	78	91.9	—	114	6	69	11	29	0	60	41	1.13	—	.90	4	1	.0	0	8.2	SE	35	W	1	20	6	5	2.7	86	0
ARKANSAS																																	
Fort Smith	458	998.3	1014.4	95	72	83.3	+2.8	104	31	65	24	26	0	71	75	4.96	+1.68	3.05	6	7	.0	0	6.5	NE	38	NW	10	20	9	2	2.7	89	0
Little Rock	257	1002.4	1015.2	94	72	82.8	+3.0	104	31	66	23	24	0	72	77	.80	-2.95	.40	7	8	.0	0	5.9	SW	30	E	18	16	9	6	3.9	79	0
Texarkana	361	1001.7	1014.7	98	74	86.0	+2.8	105	17	67	25	29	0	70	68	1.18	-2.35	.88	3	4	.0	0	7.4	NE	—	—	—	16	13	2	3.4	—	0
CALIFORNIA																																	
Bakersfield	489	992.6	1010.4	98	65	81.8	-.9	106	18	56	29	28	0	47	34	.00	-.01	.00	0	0	.0	0	5.4	WNW	—	—	—	31	0	0	.4	—	0
Beaumont CO	2589	923.8	1012.3	93	56	74.6	—	101	12	45	31	24	0	45	42	.17	—	.17	2	0	.0	0	7.7	NW	*28	E	1	26	2	3	1.5	—	6
Bishop	4108	872.3	1010.2	96	53	74.4	—	103	1	45	30	26	0	—	—	.01	—	.01	1	4	.0	0	—	—	—	—	—	18	11	2	2.5	—	1
Blue Canyon	5280	839.5	1011.5	77	57	67.2	—	87	18	41	29	0	0	36	35	T	—	T	0	3	.0	0	8.8	SW	—	—	—	21	4	6	2.4	—	54
Burbank	699	986.5	1012.6	86	60	72.8	—	96	6	54	31	7	0	56	64	.22	—	.18	3	0	.0	0	5.7	S	*20	SE	28	25	3	3	2.4	—	2
Eureka CO	43	1013.5	1015.9	59	52	55.4	-.6	65	28	49	25	0	0	—	—	.02	-.16	.01	2	0	.0	0	6.0	—	20	SW	°19	4	9	18	7.5	33	286
Fresno	331	999.0	1010.7	96	60	77.9	-1.6	104	15	54	28	27	0	54	48	.00	-.01	.00	0	0	.0	0	6.5	WNW	17	NW	°2	29	2	0	.6	100	0
Los Angeles CO	312	—	—	81	61	71.3	+.2	93	6	57	8	2	0	—	—	.15	+.13	.14	2	0	.0	0	4.9	—	18	S	28	22	7	2	2.7	80	1
Los Angeles	99	1009.1	1013.0	73	62	67.4	—	79	5	57	8	0	0	58	75	.06	—	.06	2	0	.0	0	5.3	WSW	—	—	—	15	14	2	3.7	—	1
Mt. Shasta CO	3543	891.3	1013.4	86	50	67.9	+1.5	97	17	37	31	12	0	40	42	.26	+.03	.25	2	3	.0	0	6.2	NW	—	—	—	20	9	2	2.4	—	40
Oakland	3	1013.5	1013.9	71	56	63.3	+1.1	88	14	50	12	0	0	53	75	.19	+.17	.10	3	1	.0	0	7.1	WNW	—	—	—	6	21	4	4.6	—	60
Red Bluff	341	998.0	1010.6	96	64	80.1	+.4	107	17	54	30	25	0	46	34	.04	-.01	.04	1	4	.0	0	5.9	SSE	30	SE	28	24	5	2	1.7	93	0
Sacramento CO	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Sacramento	17	1010.2	1011.1	89	56	72.6	-.3	103	15	52	7	16	0	53	58	.00	.00	.00	0	0	.0	0	10.9	SW	32	SW	28	27	4	0	1.3	95	0
Sandberg CO	4517	862.9	1011.8	84	61	72.8	—	93	17	45	30	7	0	35	31	T	—	T	0	0	.0	0	14.5	NW	—	—	—	27	4	0	1.3	—	23
San Diego	19	1009.5	1012.6	75	63	69.0	-.8	83	5	60	4	0	0	60	76	.85	+.81	.83	3	0	.0	0	6.3	W	17	W	19	15	13	3	4.0	66	0
San Francisco CO	52	—	—	62	52	57.3	-1.8	76	14	50	14	0	0	—	—	.43	+.42	.22	4	1	.0	0	10.4	—	25	W	°6	4	14	13	6.5	53	232
San Francisco	1	1012.9	1013.7	70	52	61.4	+1.6	81	14	46	27	0	0	53	81	.09	+.08	.07	2	1	.0	0	11.4	WNW	31	WNW	6	16	13	2	4.1	—	108
Santa Catalina	1568	956.7	1012.0	76	58	66.8	—	90	13	53	4	1	0	—	—	.04	—	.04	2	0	.0	0	—	—	—	—	—	24	4	3	2.2	—	43
Santa Maria	231	1005.8	1014.2	71	53	62.0	—	77	14	49	22	0	0	54	81	.01	—	.01	1	0	.0	0	5.4	W	*20	W	2	11	19	1	4.0	—	86
COLORADO																																	
Alamosa	7534	776.4	1017.8	80	48	63.6	—	88	13	36	11	0	0	—	—	1.29	—	.47	7	9	.0	0	—	—	—	—	—	13	8	10	5.0	—	65
Colorado Springs	6175	814.1	1014.7	81	55	67.9	—	91	16	48	21	1	0	48	58	4.31	—	1.42	11	14	T	T	9.7	SSE	—	—	—	10	10	11	5.4	—	28
Denver	5292	840.2	1013.5	84	57	70.7	+1.0	94	1	54	15	6	0	48	51	4.47	+3.25	3.43	9	6	1.3	1	6.9	S	33	SE	6	6	17	8	5.4	61	12
Grand Junction	4849	859.5	1012.2	87	61	73.9	-1.5	96	16	55	31	13	0	43	39	1.16	-.01	.56	8	9	.0	0	9.5	SE	49	S	24	14	8	9	4.8	65	0
Pueblo	4799	857.8	1012.6	87	59	73.3	+.6	97	12	52	16	13	0	52	59	3.50	+1.68	1.75	10	8	T	T	7.1	W	37	W	24	11	8	12	5.1	62	6
CONNECTICUT																																	
Bridgeport	7	1014.9	1015.8	80	64	71.6	—	88	31	53	6	0	0	63	78	1.84	—	.58	10	6	.0	0	6.3	SW	*25	NNW	16	7	12	12	5.8	—	1
Hartford	15	1009.5	1015.4	81	61	70.9	+2.0	91	30	48	6	1	0	62	78	3.13	-1.16	.84	11	9	.0	0	6.0	NNE	24	N	16	3	13	15	6.8	56	5
New Haven	6	1011.5	1015.2	79	63	71.0	+2.4	86	30	52	6	0	0	—	—	2.44	-1.51	.78	12	7	T	T	6.1	—	*20	SE	7	9	10	12	5.6	63	3
DELAWARE																																	
Wilmington	73	1012.5	1015.6	84	63	73.8	—	94	16	49	5	5	0	65	78	3.23	—	1.77	6	6	T	T	5.8	S	—	—	—	9	12	10	5.9	—	2
FLORIDA																																	
Apalachicola CO	13	1013.5	1014.9	90	77	83.4	+2.2	93	2	71	27	19	0	—	—	1.85	-5.70	.83	9	21	.0	0	6.3	—	26	E	25	11	16	4	4.6	72	0
Daytona Beach	33	1014.2	1016.0	91	73	82.1	+1.9	95	4	69	31	26	0	76	87	4.19	-.97	2.18	12	15	.0	0	6.7	E	*22	NNE	30	7	18	6	5.0	—	0
Fort Myers	15	1014.9	1015.4	93	75	84.0	+2.3	95	°10	71	13	31	0	76	81	10.30	+1.48	2.00	23	27	.0	0	6.2	E	—	—	—	1	26	4	5.9	—	0
Jacksonville CO	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Jacksonville	52	1014.9	1016.3	94	74	84.0	+1.7	98	2	65	27	28	0	72	74	2.19	-3.62	.76	11	8	.0	0	5.3	SE	29	W	17	6	19	6	5.2	58	0
Key West CO	5	1013.9	1014.9	93	80	86.3	+2.8	95	8	76	24	29	0	—	—	2.22	-2.29	.82	16	12	.0	0	6.2	—	21	NW	30	8	19	4	5.2	76	0
Key West	6	1014.2	1015.0	91	79	84.9	+1.9	93	9	73	23	27	0	75	73	4.04	.47	.94	15	15	.0	0	8.4	E	—	—	—	4	22	5	5.3	—	0
Lakeland CO	214	—	—	92	75	83.3	+1.3	95	29	71	31	29	0	—	—	6.95	-.83	2.18	18	24	.0	0	—	—	—	—	—	2	29	0	5.2	—	0
Melbourne	22	1014.6	1015.7	90	75	82.5	+1.4	95	8	72	16	25	0	75	82	2.18	-3.64	.90	11	15	.0	0	6.7	E	*25	NE	31	5	18	8	5.9	—	0
Miami CO	180	—	—	88	78	82.9	+.8	92	30	72	1	7	0	—	—	5.26	-.62	1.31	15	15	.0	0	8.6	—	48	N	30	4	22	5	5.8	58	0
Miami	9	1014.2	1015.3	92	76	83.6	—	95	30	72	2	29	0	74	77	5.13	—	1.45	14	15	.0	0	5.8	SE	*26	SE	14	2	20	9	6.2	—	0
Miami Beach CO	3	—	—	89	80	84.2	—	95	30	74	2	6	0	—	—	2.58	—	.81	14	—	.0	0	—	—	—	—	—	9	21	1	—	—	0
Orlando	111	1011.9	1016.0	93	75	83.8	+1.7	96	11	72	31	28	0	74	79	7.84	+.98	3.39	12	17	.0	0	7.9	NE	*38	SW	4	7	21	3	5.1	—	0
Pensacola CO	13	1013.2	1015.6	92	77	84.7	+3.8	99	30	70	14	26	0	—	—	5.28	-2.74	1.40	11	20	.0	0	6.3	—	34	NW	14	12	12	7	4.7	79	0
Pensacola CAA	110	—	1015.2	—	—	—	—	—	—	—	—	—	—	75	—	—	—	—	—	—	—	—	5.3	NW	—	—	—	—	—	—	—	—	0
Tallahassee	64	1013.9	1016.0	93	74	83.5	—	98	29	66	27	27	0	73	78	3.21	—	.95	13	16	.0	0	4.4	E	—	—	—	8	17	6	5.2	—	0
Tampa	24	1014.6	1015.7	94	75	84.4	+2.9	97	°10	70	31	30	0	74	78	7.37	-.81	1.57	14	19	.0	0	5.6	E	20	W	7	2	25	4	5.7	66	0
West Palm Beach	14	1014.2	1015.2	93	76	84.6	—	95	11	73	2	31	0	76	80	3.05	-3.29	.97	12	19	.0	0	6.1	E	—	—	—	1	22	8	6.6	—	0
GEORGIA																																	
Albany	190	1009.1	1016.1	96	73	84.6	+2.7	101	29	65	°26	30	0	72	72	6.20	+.56	4.60	9	18	.0	0	2.7	E	—	—	—	13	14	4	4.1	—	0
Atlanta CO	1054	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Atlanta	977	975.3	1015.8	91	71	80.9	+2.9	96	21	64	25	22	0	67	68	1.17	-3.53	.88	5	6	.0	0	6.7	NW	33	NW	16	13	13	5	4.5	83	0
Athens	798	—	—	93	69	80.8	—	97	°18	62	24	26	0	—	—	.09	—	.09	1	7	.0	0	—	—	—	—	—	13	16	2	4.1	—	0
Augusta	426	1008.8	1015.3	94	70	81.7	+1.3	100	22	59	31	25	0	70	74	2.29	-3.29	1.18	6	14	.0	0	5.2	SE	*23	W	8	13	15	3	4.2	—	0
Columbus	382	1001.7	1015.9	94	71	82.2	—	98	29	62	26	27	0	71	74	5.37	—	1.84	7	7	.0	0	4.5	N	—	—	—	14	13	4	4.1	—	0
Macon	354	1002.0	1015.3	95	72	83.6	—	101	22	64	26	29	0	70	70	3.08	—	1.61	6	8	.0	0	7.0	WNW	29	SW	°14	16	11	4	3.6	90	0
Rome	637	993.2	1016.0	93	67	80.4	—	99	21	60	26	30	0	69	76	2.17	—	1.04	7	12	.0	0	6.0	N	—	—	—	9	15	7	4.8	—	0
Savannah	38	1013.2	1015.6	92	72	82.3	+2.4	97	8	65	°25	24	0	72	76	9.69	+2.38	4.60	13	16	.0	0	6.1	SW	30	SW	1	6	19	6	5.2	69	0
Valdosta	200	1007.8	1015.6	95	72	83.5	+2.1	102	3	62	27	28	0	71	—	6.12	-.18	1.54	11	15	.0	0	6.9	SW	—	—	—	9	18	4	4.8	—	0
IDAHO																																	
Boise	2842	916.7	1010.4	87	58	72.2	+1.2	102	2	43	30	13	0	43	38	.07	-.12	.06	2	6	.0	0	6.6	NW	42	SE	2	15	12	4	3.9	79	23
Lewiston	1413	961.4	1012.1	87	55	71.3	—	101	2	46	31	15	0	43	39	.53	—	.39	4	2	.0	0	3.3	WNW	—	—	—	20	5	6	3.6	—	27
Pocatello	4444	862.9	1013.0	83	53	68.1	-.8	94	17	38	25	7	0	43	47	1.23	+.73	.40	7	12	T	0	6.1	S	42	W	6	13	11	7	4.6	60	31
ILLINOIS																																	
Cairo CO	314	1002.4	1014.9	90	71	80.6	+1.8	100	31	61	23	19	0	—	—	2.05	-.97	1.92	4	4	.0	0	6.1	—	26	NW	21	8	15	8	5.2	83	0
Chicago	618	993.2	1015.8	79	61	70.0	-1.6	92	31	52	24	1	0	61	77	4.86	+1.84	2.39	7	6	.0	0	6.2	S	37	SW	13	5	10	16	6.7	55	4
Joliet	580	994.6	1015.9	80	57	68.6	-2.7	94	31	46	24	1	0	62	83	2.43	-.97	1.55	8	7	.0	0	8.2	N	—	—	—	6	6	19	6.9	—	10
Moline	589	994.2	1016.1	81	62	71.5	-.2	97	30	50	23	2	0	63	78	8.00	+4.51	4.60	11	8	.0	0	7.7	E	33	S	25	6	14	11	6.2	62	4
Peoria	659	993.9	1015.9	82	62	71.7	-1.4	96	30	52	4	3	0	63	80	3.30	+.18	1.14	8	8	T	T	8.3	SE	37	W	15	10	8	13	5.9	65	2
Springfield CO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Springfield	598	992.6	1015.5	84	63	73.3	+1.1	95	30	52	4	3	0	64	78	1.96	-1.21	.67	9	7	.0	0	8.8	SE	58	W	15	7	14	10	5.8	74	0

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)					
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, (tenths sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	1000.0	1015.8	88	65	76.6	+1.6	100	31	54	24	11	0	65	73	1.81	-1.55	1.06	5	3	.0	0	6.6	NW	31	NW	9	10	11	10	5.4	77	0
Fort Wayne	801	985.8	1016.5	81	58	69.5	-1.4	98	31	47	23	2	0	61	80	2.80	-.31	1.30	8	5	.0	0	6.0	N	23	SW	21	6	11	14	6.2	75	16
Indianapolis CO	—	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	0
Indianapolis	796	987.1	1016.2	83	61	72.0	-.4	97	31	49	23	3	0	63	76	2.43	-.88	.69	6	5	.0	0	8.2	NE	35	S	6	8	11	12	5.7	75	1
South Bend	768	988.2	1016.1	78	57	67.6	-4.0	91	31	46	23	1	0	61	83	5.05	+1.57	2.46	7	7	.0	0	8.5	S	•30	NW	14	8	8	15	6.4	--	24
Terre Haute	585	995.3	1016.2	85	61	73.0	-1.8	96	31	50	23	3	0	64	78	1.38	-1.87	.56	7	5	.0	0	5.4	NNE	43	SW	15	11	10	10	5.5	73	0
IOWA																																	
Burlington	605	990.5	1015.7	82	63	72.5	-1.5	95	30	52	22	4	0	64	79	3.88	+.33	2.34	10	8	.0	0	7.6	SSE	21	W	15	7	13	11	5.8	64	1
Charles City CO	1013	979.7	1015.9	77	59	67.8	-1.3	91	30	49	18	1	0	--	--	6.55	+3.07	1.47	14	8	.0	0	5.1	—	37	S	28	10	10	11	5.8	52	20
Davenport CO	579	994.2	—	81	63	72.4	-.7	95	30	55	22	1	0	—	—	5.88	+2.39	2.05	10	9	.0	0	—	—	—	—	—	—	—	—	—	—	0
Des Moines	800	984.8	1015.6	82	62	72.3	+.1	96	30	52	22	3	0	64	79	4.74	+1.22	1.30	9	11	.0	0	9.1	SE	50	W	14	7	17	7	5.3	70	4
Dubuque	641	977.0	1015.8	77	59	67.9	—	89	30	50	4	0	0	61	84	4.63	—	1.18	12	9	.0	0	8.8	S	•38	SE	15	5	8	18	6.9	—	19
Sioux City	1097	973.6	1014.3	82	61	71.8	+.6	95	7	50	22	4	0	63	80	7.75	+4.62	2.62	9	9	T	T	7.4	SSE	56	NW	14	6	10	15	6.3	58	5
KANSAS																																	
Concordia CO	1375	964.8	1013.5	88	67	77.0	+.5	102	29	58	16	10	0	--	—	4.28	+1.37	1.56	14	13	T	T	7.1	—	28	N	26	12	12	7	4.8	65	0
Dodge City	2594	926.9	1012.5	90	66	78.4	+.7	101	30	56	21	18	0	61	61	2.17	-.50	1.17	9	12	T	T	13.1	S	57	NW	8	16	8	7	4.0	72	4
Goodland	3645	888.9	1012.8	87	60	73.4	-.9	99	29	53	11	16	0	58	69	1.81	-.72	.70	7	10	T	T	9.6	SSE	•38	WNW	10	10	16	5	5.2	—	6
Topeka CO	—	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	0
Topeka	926	979.0	1014.3	88	66	77.3	—	100	6	56	16	11	0	67	77	5.07	—	1.54	14	14	.0	0	9.1	SE	54	N	27	8	15	8	5.5	54	0
Wichita	1372	966.1	1013.5	90	69	79.7	+1.4	104	30	61	21	16	0	66	71	5.38	+2.25	1.63	12	11	.0	0	11.7	S	49	SW	31	16	9	6	4.2	75	0
KENTUCKY																																	
Lexington	979	981.0	1016.2	88	64	76.1	+1.6	97	31	54	25	12	0	62	66	2.98	-.47	1.18	8	7	.0	0	6.6	SSW	--	—	—	10	11	10	5.2	—	0
Louisville CO	—	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	0
Louisville	485	999.3	1015.5	89	65	77.1	+1.0	98	31	54	25	15	0	64	68	2.66	-.76	.89	5	6	.0	0	6.0	N	37	NW	9	11	12	8	5.2	71	0
LOUISIANA																																	
Baton Rouge	64	1014.2	1015.3	96	74	85.2	-3.5	102	13	70	17	31	0	73	77	1.42	-4.09	.81	7	11	.0	0	5.3	W	--	—	—	16	13	2	3.7	--	0
Lake Charles	12	1013.5	1015.0	97	75	86.0	+4.1	104	15	70	11	30	0	75	81	1.00	-4.84	.61	7	9	.0	0	7.7	SW	--	—	—	17	12	2	3.4	—	0
New Orleans CO	12	1013.2	—	95	79	87.1	+4.9	99	14	71	31	31	0	--	—	4.00	-1.80	1.55	10	14	.0	0	5.2	—	25	NE	16	11	18	2	4.4	71	0
New Orleans	12	1013.2	1015.4	96	76	85.8	—	100	14	71	16	31	0	75	80	4.93	—	2.07	6	17	.0	0	6.1	SW	•48	ENE	16	15	15	1	3.7	—	0
Shreveport	174	1004.1	1014.4	99	76	87.5	+4.7	106	17	70	25	30	0	72	67	.47	-2.23	.44	4	5	.0	0	7.8	SE	33	SE	31	24	6	1	2.4	94	0
MAINE																																	
Caribou	624	991.9	1014.7	71	52	61.8	+.3	81	29	42	6	0	0	55	81	4.52	+1.23	1.35	16	4	.0	0	8.8	NW	•30	W	15	2	6	23	7.9	—	108
Eastport	33	1011.9	1014.6	69	55	61.8	+1.1	80	13	51	31	0	0	—	—	5.89	+2.89	2.10	16	4	.0	0	7.5	—	35	S	9	3	11	17	7.3	54	97
Portland	61	1010.8	1014.8	77	56	66.4	+1.8	86	30	47	7	0	0	60	84	2.48	-.66	.62	13	5	.0	0	6.7	S	26	S	21	6	11	14	6.5	53	31
MARYLAND																																	
Baltimore CO	14	—	—	85	69	76.7	+1.2	96	16	56	5	7	0	--	—	.77	-3.60	.61	--	—	—	-	—	—	—	—	—	—	—	—	—	—	0
Baltimore	146	1011.5	1016.1	86	64	74.8	—	96	16	50	24	9	0	64	73	.77	—	.58	6	2	.0	0	8.4	N	25	SW	21	11	12	8	5.0	60	0
Frederick	294	—	—	87	61	74.0	—	96	11	47	24	10	0	—	—	1.56	—	.84	7	2	.0	0	—	—	—	—	—	—	—	—	—	—	3
MASSACHUSETTS																																	
Boston	12	1010.8	1015.2	79	63	70.7	+.8	89	31	54	6	0	0	61	74	3.23	-.39	1.42	9	5	T	T	10.6	SW	32	NE	16	7	13	11	6.4	55	3
Nantucket	43	1014.9	1015.4	75	61	67.6	-.2	83	11	55	5	0	0	63	86	3.82	+.42	1.28	8	5	.0	0	7.1	SW	32	SE	8	9	7	15	6.5	55	4
Pittsfield	1153	973.6	1015.6	76	53	64.6	-.7	86	30	41	6	0	0	--	—	2.77	-1.36	.62	12	7	T	0	5.5	—	—	—	—	7	11	13	6.3	--	71
MICHIGAN																																	
Alpena CO	587	994.6	1017.3	70	55	62.6	-1.5	83	2	46	23	0	0	--	—	4.01	+1.15	1.28	10	4	.0	0	8.9	—	34	NW	31	6	11	14	6.2	67	85
Detroit	619	989.8	1016.2	80	59	69.5	+.3	95	31	48	24	3	0	58	72	2.99	+.21	1.02	7	4	.0	0	7.4	N	36	W	21	10	11	10	5.2	67	14
Escanaba CO	594	994.2	1016.6	69	55	61.9	-2.4	80	8	42	4	0	0	—	—	3.84	+.65	.83	15	4	.0	0	9.2	—	32	NW	31	5	12	14	6.7	51	116
Grand Rapids CO	638	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	13
Grand Rapids	638	991.2	1016.3	77	56	66.5	-1.5	88	29	43	24	0	0	58	79	3.18	+5.70	.87	10	6	.0	0	5.7	SE	30	W	21	6	11	14	6.4	71	32
Lansing	859	984.8	1016.5	77	56	66.4	-2.9	90	31	42	24	1	0	58	78	2.84	+.02	1.07	13	7	.0	0	8.2	SSE	41	W	21	9	14	8	5.4	67	37
Marquette CO	677	989.5	1017.3	68	53	60.8	-3.0	86	26	44	4	0	0	--	--	5.40	+2.73	2.34	15	8	.0	0	7.0	—	25	SW	2	4	10	17	7.2	55	156
Muskegon	627	993.2	1016.1	75	56	65.6	-2.7	86	30	43	4	0	0	58	81	4.17	+1.77	1.06	10	5	T	T	6.8	NE	•30	WNW	21	8	10	13	6.0	—	46
Sault Ste. Marie	721	994.2	1017.0	69	50	59.8	-1.0	79	29	39	5	0	0	54	85	4.34	+1.64	1.52	11	5	.0	0	6.9	NW	28	NW	22	5	7	19	7.2	41	162
Ypsilanti	722	988.5	1016.0	79	58	68.8	—	95	31	48	23	2	0	59	75	2.76	—	.98	8	4	.0	0	8.4	NE	•30	W	21	10	8	13	5.7	—	14
MINNESOTA																																	
Duluth	1128	974.9	1016.5	67	51	59.1	—	81	2	44	31	0	0	53	85	6.64	—	2.90	18	7	.0	0	10.8	E	41	NE	30	4	8	19	7.4	49	180
Intern'l. Falls	1179	973.2	1016.3	70	49	59.7	-4.5	85	1	39	11	0	0	53	81	6.58	+3.45	2.23	15	6	.0	0	—	—	—	—	—	7	10	14	6.7	--	168
Minneapolis	830	982.7	1015.9	77	60	68.1	-1.8	90	28	51	12	1	0	59	77	1.94	-1.18	.70	8	3	T	T	8.7	SE	47	W	7	7	8	16	6.7	46	19
Rochester	1014	979.0	1015.9	77	58	67.2	-1.9	90	30	46	18	1	0	59	80	4.56	+1.14	1.56	12	7	T	0	7.9	SE	--	—	—	2	11	18	7.4	—	38
St. Cloud	1034	977.7	1015.4	74	55	64.8	-4.0	90	1	45	22	1	0	58	82	4.95	+1.77	1.45	12	6	T	0	6.2	SSE	—	—	—	6	9	16	7.0	—	53
St. Paul	703	989.2	1015.2	76	59	67.9	-1.5	88	28	51	22	0	0	59	76	3.28	+.27	1.55	10	5	.0	0	7.2	SSE	•35	NNE	7	7	6	18	6.9	—	23
MISSISSIPPI																																	
Jackson	315	1003.7	1015.7	99	73	85.7	+4.4	103	31	66	24	31	0	70	65	2.19	-1.69	1.51	4	4	.0	0	6.7	NW	38	SE	31	19	9	3	2.9	85	0
Meridian	294	1002.0	1015.2	99	71	84.9	+6.3	104	31	64	24	31	0	69	67	.79	-3.75	.50	4	7	.0	0	4.9	NW	--	—	--	21	9	1	2.9	—	0
Vicksburg CO	234	1007.8	—	95	75	84.7	+3.9	100	31	67	24	30	0	--	--	.35	-3.11	.35	1	3	.0	0	7.2	—	30	N	16	17	11	3	3.5	86	0
MISSOURI																																	
Columbia	733	987.1	1015.2	86	66	75.5	-.1	97	29	55	22	7	0	67	80	6.05	+2.45	2.13	12	11	.0	0	7.6	SE	45	NW	20	11	9	11	5.2	66	0
Kansas City	741	980.4	1014.5	88	69	78.1	+1.5	100	6	64	16	11	0	66	71	6.87	+3.33	1.45	17	17	T	0	7.5	SSW	65	NW	31	8	16	7	5.0	71	0
St. Joseph	809	980.0	1014.1	87	66	76.7	+.2	97	30	55	22	10	0	67	75	9.83	+6.00	2.37	17	16	.0	0	8.5	SSE	57	NW	15	11	13	7	5.0	70	0
St. Louis CO	465	994.9	—	86	70	77.8	+.3	99	30	60	4	9	0	--	--	2.44	-.55	1.17	11	7	.0	0	—	—	34	NW	15	10	11	10	5.5	69	0
St. Louis	465	994.9	1015.3	87	67	76.6	+.2	98	30	58	22	10	0	66	74	2.78	-.24	1.02	10	6	.0	0	5.6	S	--	—	—	7	14	10	5.9	—	0
Springfield	1265	968.8	1015.3	87	66	76.9	+1.9	100	31	57	22	10	0	68	80	3.47	-.62	1.38	11	11	T	T	10.1	SSE	42	NW	9	6	16	9	5.6	72	0
MONTANA																																	
Billings	3568	891.6	1013.3	80	55	67.3	-3.3	94	3	45	26	3	0	48	55	1.95	—	.51	13	14	T	0	8.3	NNE	42	NW	1	7	16	8	5.1	69	45
Butte	5530	831.7	1017.0	74	42	57.9	-2.8	87	1	30	31	0	1	40	60	1.68	+.78	.51	13	11	.0	0	7.6	S	--	—	—	7	14	10	5.8	--	230
Glasgow CO	2090	940.4	1014.1	80	53	66.5	-2.1	99	3	40	27	5	0	49	58	1.63	+.40	.38	14	8	.0	0	—	—	--	—	—	8	6	17	6.3	--	62
Great Falls	3664	889.3	1014.6	74	51	62.7	-4.4	96	3	44	30	2	0	43	55	2.50	+1.33	1.00	10	6	.0	0	9.9	SW	34	W	24	7	11	13	6.2	63	136
Havre CO	2488	926.5	1014.4	78	53	65.0	-.4	102	3	41	31	5	0	--	--	3.17	+1.95	.84	11	4	T	T	7.6	—	28	N	22	8	14	9	5.4	66	90
Helena	3893	874.7	1014.9	76	49	62.5	-2.1	91	3	37	31	1	0	46	59	1.58	+.81	.43	11	12	T	T	6.0	W	36	W	2	10	10	11	5.8	70	112
Kalispell	2965	911.3	1013.0	76	46	61.4	—	95	2	37	25	2	0	45	60	2.63	—	1.35	11	8	.0	0	7.1	NE	--	—	--	10	9	12	5.4	--	139
Miles City	2629	930.6	1013.3	83	56	69.5	—	100	1	47	15	7	0	52	—	4.00	—	1.09	12	12	T	0	9.8	NNE	--	—	—	12	12	7	4.7	—	20
Missoula	3201	901.5	1014.1	80	49	64.2	.0	97	2	39	25	4	0	44	52	.83	+.08	.44	6	10	.0	0	6.2	NW	42	NW	24	10	8	13	5.7	59	83
NEBRASKA																																	
Grand Island	1841	948.5	1013.1	85	62	73.5	—	98	2	54	21	7	0	63	76	3.39	—	1.25	14	14	T	T	11.8	SSE	--	—	—	11	12	8	5.1	—	1
Lincoln CO	1184	971.9	—	86	65	75.6	+1.2	102	5	55	22	8	0	--	—	4.55	+.98	1.22	11	11	.0	0	7.6	—	39	NW	12	--	--	—	—	62	1
Lincoln	1180	971.9	1014.1	86	64	74.8	+1.3	102	5	52	22	9	0	65	—	5.46	+1.89	1.51	12	14	.0	0	9.2	SE	--	—	—	8	17	6	5.1	—	2
Norfolk	1554	959.4	1014.3	83	61	71.9	-1.2	99	5	51	22	6	0	62	77	5.93	+2.84	2.11	11	10	.0	0	9.4	SSE	—	—	—	8	12	11	5.7	—	5
North Platte	2783	916.0	1012.9	83	60	71.4	+.6	94	5	52	11	7	0	61	75	2.28	-.11	.90	12	15	T	T	9.3	SE	35	N	20	7	11	13	6.0	52	9
Omaha	978	975.3	1014.5	85	64	74.7	+1.5	99	30	53	22	8	0	65	76	7.03	+3.98	2.26	9	11	T	T	9.0	SSE	39	N	12	8	16	7	5.3	64	1
Scottsbluff	3950	880.1	1013.1	84	66	70.1	-1.4	97	1	46	15	6	0	53	65	1.08	-.34	.54	6	12	.0	0	7.8	NW	--	—	—	9	17	5	4.8	—	16
Valentine CO	2581	924.5	1014.6	81	58	69.4	-2.3	93	6	45	21	4	0	—	--	6.22	+4.05	2.28	10	11	T	T	8.2	—	40	W	14	9	11	11	5.5	64	19

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
NEVADA																																	
Elko	5075	845.2	1013.3	86	46	66.2	—	97	16	34	30	9	0	40	42	0.27	—	0.12	4	9	.0	0	5.4	SW	—	—	—	15	12	4	3.7	—	50
Ely	6257	810.0	1012.9	82	48	64.8	+3.5	92	15	38	7	1	0	—	—	1.05	-.06	.40	7	8	T	0	11.3	—	42	N	°7	17	9	5	4.0	75	48
Las Vegas	2162	934.6	1008.6	100	71	85.5	+.7	110	18	62	31	29	0	40	26	.16	-.37	.09	6	7	.0	0	7.6	SW	—	—	—	20	7	4	2.6	83	0
Reno	4397	861.8	1012.7	88	45	66.5	+.8	98	18	35	30	14	0	39	42	.13	-.09	.09	3	6	.0	0	5.6	WNW	57	S	20	22	9	0	2.3	88	37
Winnemucca	4299	866.9	1012.1	88	47	67.6	-1.7	98	16	29	30	14	1	33	30	.22	+.02	.17	2	6	.0	0	7.6	—	50	S	18	15	9	7	3.7	87	42
NEW HAMPSHIRE																																	
Concord	339	1004.7	1015.4	79	54	66.4	+.9	90	11	41	6	1	0	59	80	2.39	-1.15	.99	15	7	.0	0	4.0	NW	25	NW	20	17	11	13	6.3	58	47
Mt. Washington	6262	810.0	1021.7	52	41	46.3	-1.7	61	11	29	2	0	2	—	96	7.88	+1.73	1.20	23	4	T	0	22.2	W	105	W	1	0	11	20	8.3	20	572
NEW JERSEY																																	
Atlantic City CO	8	1013.2	1014.9	79	68	73.6	+1.1	92	1	56	5	1	0	—	—	1.15	-3.34	.54	10	7	.0	0	11.4	—	34	SE	7	8	12	11	5.5	72	1
Newark	11	1014.2	1015.5	83	65	74.2	+1.2	91	30	57	5	5	0	63	73	2.56	-2.36	.79	9	6	.0	0	7.4	SW	•27	SW	21	7	12	12	6.0	—	0
Trenton CO	56	1008.8	1015.6	83	65	73.6	+.6	91	P10	53	5	3	0	—	—	3.44	-1.31	1.78	7	5	.0	0	7.1	—	39	S	21	8	11	12	6.1	71	1
NEW MEXICO																																	
Albuquerque	5310	850.7	1011.9	89	64	76.6	+2.7	98	14	58	26	16	0	52	48	2.22	+.98	.64	7	11	.0	0	6.5	S	61	SE	15	12	11	8	4.6	69	0
Clayton	4969	850.0	1013.3	87	59	73.1	+.4	99	7	54	16	12	0	56	60	2.24	+.11	.92	6	9	.0	0	13.2	SSW	—	—	—	17	10	4	3.6	—	9
Raton	6379	808.7	1014.0	83	53	68.4	—	92	7	45	11	6	0	50	60	3.93	—	1.76	9	14	T	0	7.6	SSW	—	—	—	9	17	5	5.1	—	13
Roswell	3611	895.4	1012.0	95	66	80.4	+3.8	103	8	61	22	27	0	56	48	1.76	-.39	.93	10	10	.0	0	8.2	SSE	44	SW	28	18	8	5	3.6	79	0
NEW YORK																																	
Albany	277	1011.2	1015.0	79	57	68.3	-.7	89	30	47	6	0	0	59	78	4.40	+1.31	1.78	12	10	T	T	5.2	S	29	S	21	5	12	14	6.5	58	17
Bear Mountain	1300	—	—	76	60	68.1	—	83	30	50	5	0	0	—	—	5.19	—	1.27	10	7	.0	0	—	—	—	—	—	9	8	14	6.0	—	24
Binghamton	858	957.7	1016.3	76	56	66.0	—	89	31	44	4	0	0	57	75	1.38	—	.62	10	8	.0	0	8.4	NW	37	NW	22	6	15	10	6.2	53	64
Buffalo	693	988.8	1016.7	80	57	68.5	+.1	92	31	46	5	3	0	56	68	1.36	-1.72	.86	6	1	.0	0	11.0	SW	45	SW	21	9	12	10	5.9	62	22
New York CO	10	1003.7	—	82	66	73.8	+.7	90	30	56	5	1	0	—	—	1.46	-2.87	.57	9	5	T	0	9.9	—	52	SW	21	10	9	12	5.7	70	0
New York	19	1013.9	1015.6	83	67	75.1	—	93	30	59	5	3	0	63	71	2.97	—	1.17	9	5	.0	0	9.9	S	35	N	15	10	7	14	6.0	—	0
Oswego	292	1003.1	1015.2	75	59	66.8	-1.0	85	31	49	5	0	0	—	—	1.83	-.77	.91	8	2	.0	0	7.0	—	33	N	3	12	10	9	4.9	68	37
Rochester	543	996.6	1016.0	79	56	67.9	-1.3	89	9	45	5	0	0	57	73	.76	-2.12	.41	6	4	.0	0	7.5	SW	35	SW	21	9	16	6	5.2	65	28
Syracuse	399	994.2	1015.8	78	57	67.6	+.3	90	31	45	5	1	0	59	76	3.33	+.47	1.37	10	6	.0	0	7.0	NW	27	N	3	6	15	10	6.0	60	38
NORTH CAROLINA																																	
Asheville CO	2203	—	—	87	64	75.2	+4.7	94	7	57	5	8	0	—	—	1.50	-2.66	.57	8	4	T	0	4.9	—	25	E	14	8	18	5	5.1	73	0
Asheville	2093	944.1	1016.1	—	—	—	—	—	—	—	—	—	-	65	81	—	—	—	—	—	—	-	3.9	NNW	—	—	—	—	—	—	—	—	-
Charlotte	741	983.4	1015.6	91	69	79.7	+3.8	100	8	61	24	21	0	68	73	2.43	-2.64	.84	9	10	.0	0	5.8	N	30	NW	22	5	22	4	5.4	83	0
Greensboro	891	985.1	1016.6	88	66	77.0	+1.4	96	10	57	5	12	0	67	76	5.19	-.05	2.49	8	10	.0	0	6.3	SW	32	N	11	8	16	7	5.2	65	0
Hatteras	4	1014.9	1015.4	84	74	79.0	+1.0	89	18	68	7	0	0	73	82	5.24	-.51	1.54	12	16	.0	0	11.2	SSW	26	N	4	9	13	9	5.5	66	0
Raleigh CO	400	—	—	89	69	78.8	+1.8	98	8	59	25	17	0	—	—	5.24	-.17	2.23	11	5	T	0	4.1	—	20	SW	14	4	21	6	5.8	57	0
Raleigh	438	1000.3	1015.8	89	67	78.1	—	98	8	55	26	17	0	68	78	4.03	—	1.51	22	9	.0	0	5.6	NE	—	—	—	11	17	3	4.8	—	0
Wilmington CO	6	1014.2	1015.6	88	72	79.8	+2.2	94	8	63	24	14	0	—	—	6.62	+.26	2.78	12	9	.0	0	7.5	—	32	NE	13	5	14	12	6.3	48	0
Wilmington	30	1014.2	1015.6	—	—	—	—	—	—	—	—	—	-	72	—	—	—	—	—	—	—	-	4.9	SSW	—	—	—	—	—	—	—	—	—
Winston-Salem	967	981.7	1016.4	88	68	77.9	+1.7	98	10	60	25	12	0	65	71	4.02	-.71	3.00	9	5	.0	0	7.3	NE	—	—	—	11	14	6	4.8	—	0
NORTH DAKOTA																																	
Bismarck	1653	955.0	1014.7	77	54	65.5	-1.2	97	1	44	11	3	0	55	74	4.89	+3.07	2.06	14	12	T	T	8.7	E	35	E	28	6	11	14	6.5	54	67
Devils Lake CO	1471	962.1	1014.2	74	53	63.4	-1.4	91	1	47	27	1	0	—	—	3.21	+.73	1.11	16	7	.0	0	7.6	—	24	S	23	8	10	13	5.7	48	89
Fargo	895	980.4	1014.6	75	55	64.8	-1.3	94	1	44	22	1	0	56	76	5.64	+2.75	1.53	12	7	T	T	10.8	SSE	59	N	1	6	9	16	6.5	50	56
Williston CO	1877	947.5	—	75	54	64.8	-1.3	92	1	42	21	2	0	51	68	2.86	+1.39	.82	12	6	.0	0	7.2	—	34	W	25	4	11	16	7.0	64	81
OHIO																																	
Akron	1210	979.0	1016.9	81	57	68.6	-2.4	90	29	45	24	4	0	68	72	2.01	-1.39	1.38	9	4	.0	0	6.7	N	—	—	—	9	16	6	5.2	—	29
Cincinnati Obs.	761	—	—	88	64	75.8	+2.2	103	31	52	25	9	0	—	—	.59	-2.82	.18	9	4	.0	0	4.7	—	15	W	21	—	—	—	—	58	0
Cincinnati	871	984.4	1016.0	87	63	74.9	—	98	31	49	5	11	0	60	65	1.28	—	.55	12	7	.0	0	7.3	N	—	—	—	9	15	7	5.2	—	0
Cleveland CO	—	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	12
Cleveland	787	989.2	1016.4	82	59	70.3	+.1	95	30	45	25	5	0	59	70	2.43	-.34	1.55	4	1	.0	0	8.2	N	29	W	21	12	10	9	5.2	69	14
Columbus CO	724	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	3
Columbus	815	986.5	1016.2	84	59	71.8	+.4	98	31	46	5	7	0	59	67	.58	-2.99	.34	3	1	.0	0	5.7	NNW	26	W	3	9	15	7	5.2	65	8
Dayton	1002	980.7	1016.4	84	62	72.8	-.1	100	31	50	23	5	0	59	67	1.71	-1.56	.71	7	3	.0	0	7.4	N	42	W	11	7	17	7	5.5	68	1
Sandusky	603	993.6	—	80	63	71.3	-.5	99	31	52	25	3	0	—	—	1.30	-1.86	.50	7	3	.0	0	6.1	—	20	W	21	12	15	4	4.7	74	3
Toledo	621	993.6	1016.6	80	59	69.6	-.6	101	31	47	24	3	0	60	73	1.50	-1.36	.68	5	2	.0	0	7.4	SW	28	NW	21	7	13	11	5.5	58	21
Youngstown	1178	974.3	1016.5	80	56	68.0	-1.2	91	P30	44	5	2	0	57	73	2.58	-.56	1.07	8	3	.0	0	6.3	N	•30	WNW	14	10	15	6	5.0	—	31
OKLAHOMA																																	
Oklahoma City CO	1254	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	0
Oklahoma City	1254	967.8	1013.5	96	73	84.2	+4.5	105	6	64	22	26	0	66	62	1.51	-1.38	.75	7	6	.0	0	12.7	S	52	NW	17	19	5	7	3.5	82	0
Tulsa	672	989.8	1013.3	95	72	83.6	+3.5	106	6	63	22	25	0	68	67	2.53	-.75	1.86	8	6	T	T	9.2	S	56	W	10	17	6	8	4.0	83	0
OREGON																																	
Baker	3369	—	—	—	—	—	—	—	—	—	—	—	-	41	—	—	—	—	—	—	—	-	5.7	NNW	—	—	—	—	—	—	—	—	—
Baker CO	3446	894.7	1013.9	82	49	65.7	+1.1	98	2	36	30	7	0	—	—	.46	-.03	.31	3	5	.0	0	5.8	—	17	N	°6	17	10	4	3.8	88	80
Burns CO	4140	872.7	1012.6	84	51	67.3	+2.7	95	2	31	30	10	1	35	32	.12	-.13	.12	2	1	T	0	—	—	—	—	—	19	7	5	3.3	—	59
Eugene	364	1002.7	1016.2	83	48	65.8	—	99	20	41	25	5	0	49	61	.51	—	.51	1	1	T	T	7.5	N	—	—	—	21	6	4	2.8	—	44
Meacham	4050	877.1	1015.6	76	49	62.4	—	87	2	37	29	0	0	36	41	.08	—	.08	2	4	.0	0	5.4	WNW	—	—	—	17	8	6	3.8	—	124
Medford	1314	966.8	1013.4	89	53	71.2	+.1	100	19	44	30	21	0	45	43	.27	+.10	.27	1	0	.0	0	5.4	N	•25	NNW	27	24	2	5	2.4	—	19
Pendleton	1489	960.4	1013.2	84	57	70.7	+.2	96	21	48	31	8	0	44	41	T	-.52	T	0	0	.0	0	8.5	NW	—	—	—	19	8	4	3.0	—	18
Portland CO	30	—	—	78	56	67.4	+.7	96	20	49	29	3	0	—	—	.13	-.51	.13	1	—	.0	0	—	—	—	—	—	—	—	—	—	—	24
Portland	21	1010.2	1016.2	78	53	65.7	.0	94	20	44	29	3	0	52	65	.02	—	.02	1	0	.0	0	6.0	NNW	23	SW	27	14	10	7	4.0	70	43
Roseburg CO	479	997.0	1015.2	84	54	68.8	+.8	99	20	46	30	5	0	—	—	.06	-.28	.06	2	1	.0	0	5.2	—	30	W	28	21	5	5	2.9	89	18
Salem	195	1008.8	1016.2	81	49	64.7	-2.1	98	20	43	24	4	0	49	63	.65	+.18	.52	2	1	T	0	6.3	NW	—	—	—	21	6	4	3.2	—	52
Sexton Summit CO	3836	—	—	77	51	64.1	—	88	20	40	29	0	0	—	—	.17	—	.17	1	0	.0	0	—	—	—	—	—	23	3	5	2.4	—	83
Troutdale	29	—	—	81	51	65.7	—	99	21	41	29	4	0	—	—	.58	—	.57	2	0	.0	0	—	—	—	—	—	13	11	7	4.1	—	42
PENNSYLVANIA																																	
Allentown	381	1002.4	1016.3	82	59	70.5	-1.6	90	30	46	5	2	0	62	78	2.65	-1.75	1.90	12	7	.0	0	4.4	SW	—	—	—	5	18	8	5.5	—	13
Curwensville	2215	—	—	77	54	65.1	—	88	30	40	5	0	0	56	77	1.44	—	.55	8	6	.0	0	7.2	WNW	•23	W	21	7	17	7	5.7	—	75
Erie CO	635	—	—	77	62	69.3	-.3	92	31	51	5	1	0	—	—	1.26	-2.01	.40	8	3	.0	0	6.3	—	25	SW	21	15	11	5	4.6	63	17
Harrisburg	335	1002.0	1015.6	83	62	72.8	+.2	94	30	49	5	8	0	61	70	1.25	-2.79	.96	3	3	.0	0	5.7	NW	21	NE	10	16	7	8	4.5	71	5
Park Place	1932	—	—	76	58	67.3	—	86	30	43	5	0	0	—	—	4.12	—	1.71	12	5	.0	0	—	—	—	—	—	—	—	—	5.6	—	42
Philadelphia CO	26	—	—	84	67	75.6	+.8	93	16	55	4	6	0	—	—	.54	-4.08	.25	6	6	.0	0	6.3	—	24	SW	21	5	16	9	6.0	66	0
Philadelphia	13	1011.2	1015.4	85	65	74.9	+1.6	94	16	52	5	7	0	64	72	.89	-3.73	.54	7	5	.0	0	7.1	N	•43	WSW	21	6	14	11	6.2	—	0
Pittsburgh CO	749	—	—	84	63	73.4	+.9	94	15	50	5	7	0	—	—	.49	-2.74	.10	8	—	.0	0	—	—	—	—	—	—	—	—	—	54	3
Pittsburgh	1248	986.1	1016.5	82	61	71.4	+.1	92	31	48	5	4	0	58	65	.55	-2.68	.24	8	2	.0	0	7.9	NNW	28	W	21	9	15	7	5.5	60	12
Reading CO	266	1003.7	1015.2	84	64	73.9	+1.0	94	30	52	6	7	-	—	—	.56	-3.65	.31	6	6	.0	0	7.8	—	38	N	15	7	14	10	6.0	66	0
Scranton CO	746	986.8	1015.6	81	59	70.0	+.2	91	30	46	6	3	0	—	—	1.62	-2.07	.64	9	4	T	0	4.9	—	37	S	16	7	17	7	5.4	53	23
Williamsport	527	997.0	1015.8	85	58	71.1	+.2	96	30	44	5	10	0	58	69	.96	-3.01	.67	6	4	.0	0	5.7	NW	•33	NNW	1	9	17	5	5.0	—	13
RHODE ISLAND																																	
Block Island	110	1011.5	1015.7	76	63	69.5	+1.0	83	30	56	6	0	0	—	—	3.14	-.53	1.94	8	5	.0	0	—	—	—	—	—	6	12	13	6.2	—	1
Providence CO	12	—	—	81	62	71.3	+.3	89	31	53	6	0	0	—	—	3.66	+.16	1.32	11	5	.0	0	—	—	—	—	—	—	—	—	—	—	2
Providence	55	1009.5	1015.5	79	61	69.9	+.5	87	30	52	6	0	0	62	79	2.36	-1.14	.67	11	5	.0	0	6.8	SSW	34	NE	16	7	12	12	6.1	67	6

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)					
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F		°F.				°F.	%	In.	In.	In.			In.	In.	M p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1013.9	---	88	76	82.0	+1.0	95	9	69	24	15	0	--	--	3.82	-2.71	1.49	8	13	T	0	8.4	---	35	SE	23	10	12	9	5.1	71	0
Charleston	41	1013.9	1015.7	89	70	79.7	+.4	96	8	62	6	15	0	73	83	4.56	-2.59	.99	11	14	.0	0	5.4	SW	--	---	--	7	18	6	5.5	--	0
Columbia CO	332	1002.7	---	93	71	81.9	+2.3	100	9	64	31	24	0	--	--	.79	-4.68	.48	9	9	.0	0	6.9	---	28	NW	16	15	13	3	4.1	73	0
Columbia	217	1007.1	1015.2	94	70	82.2	---	101	8	59	31	26	0	69	71	1.27	---	.62	10	12	.0	0	5.6	SSW	--	---	--	14	15	2	4.0	--	0
Florence	146	1009.8	1015.4	92	69	80.5	---	98	°8	61	°24	21	0	70	77	4.28	---	2.23	8	11	.0	0	6.6	SW	--	---	--	10	15	6	5.2	--	0
Greenville	1006	978.7	1015.3	91	70	80.1	+4.3	97	9	65	25	18	0	67	71	7.02	+1.52	3.80	9	10	.0	0	5.6	NNE	54	W	13	12	13	6	4.8	80	0
Spartanburg	801	986.5	1015.9	91	69	80.2	+2.3	98	8	63	24	21	0	67	69	1.67	-3.77	.84	7	8	.0	0	6.5	W	•30	NW	16	9	17	5	5.0	--	0
SOUTH DAKOTA																																	
Huron	1282	967.5	1013.9	81	58	69.1	-.3	97	5	46	22	4	0	58	74	4.46	+2.00	2.13	10	12	T	T	9.6	SSE	50	NW	7	5	15	11	6.1	70	28
Rapid City	3215	901.8	1013.9	82	57	69.5	.0	97	6	47	21	7	0	53	63	2.92	+1.22	.74	12	13	.0	0	11.1	NW	65	NW	1	12	11	8	4.8	59	19
Sioux Falls	1420	964.1	1014.8	80	58	69.2	-1.9	94	7	46	22	1	0	59	77	2.16	-.97	.75	11	10	.0	0	8.7	SSE	35	SE	12	5	11	15	6.5	--	18
TENNESSEE																																	
Bristol	1519	963.4	1016.8	85	63	73.6	-1.5	90	21	54	25	3	0	65	78	3.46	-.83	1.38	9	7	.0	0	3.9	NE	--	---	--	9	13	9	5.5	--	0
Chattanooga	670	988.8	1015.8	93	68	80.3	+4.6	98	31	61	23	26	0	68	83	2.57	-1.46	1.25	9	14	.0	0	3.9	NE	38	SE	21	9	15	7	5.1	64	0
Knoxville	949	981.7	1016.1	90	68	78.9	+3.5	96	2	60	24	16	0	67	71	1.30	-2.62	.68	8	6	.0	0	5.3	W	36	W	9	10	11	10	5.3	54	0
Memphis	263	1001.0	1015.5	94	71	82.2	+3.8	103	31	63	24	25	0	70	70	2.72	-.68	1.34	7	6	.0	0	7.5	NE	35	N	18	16	10	5	3.6	86	0
Nashville	577	995.9	1015.5	92	69	80.4	+2.6	101	31	59	24	25	0	67	68	.95	-2.76	.62	6	8	.0	0	5.6	S	31	W	27	11	13	7	5.0	61	0
TEXAS																																	
Abilene	1752	953.3	1011.0	100	75	87.1	+6.8	104	5	68	13	31	0	60	48	.22	-2.02	.14	4	4	.0	0	9.6	S	42	SE	18	22	4	5	2.8	90	0
Amarillo	3590	890.3	1012.2	93	66	79.7	+5.1	103	7	59	10	24	0	57	54	1.52	-1.56	.99	6	3	.0	0	12.5	S	35	SW	23	18	8	5	3.5	74	0
Austin	515	992.9	1014.1	100	75	87.6	+3.8	105	5	72	13	30	0	67	61	2.07	+.02	1.95	2	2	.0	0	8.4	S	29	SE	18	22	7	2	2.5	90	0
Big Spring	2533	926.5	1013.1	97	72	84.4	+1.9	104	8	63	12	28	0	58	47	1.90	-.11	.92	5	6	.0	0	13.6	S	--	---	--	23	5	3	2.4	--	0
Brownsville	16	1010.8	1013.4	92	76	84.0	+.1	96	18	72	2	28	0	75	82	6.11	+3.25	4.39	5	6	.0	0	10.8	SE	34	SE	1	15	12	4	4.3	75	0
Corpus Christi	40	1013.5	1014.4	96	77	86.3	+4.7	99	4	72	12	31	0	75	79	.14	-2.13	.12	2	2	.0	0	12.3	SSE	38	S	8	21	6	4	3.3	93	0
Dallas	487	995.3	1013.4	102	79	90.3	+6.8	107	16	70	22	31	0	66	53	1.97	-.80	1.76	3	2	.0	0	8.7	SE	34	SE	18	23	[illegible]	0	2.0	94	0
Del Rio	957	980.0	1013.5	101	77	89.0	+4.8	105	8	72	13	31	0	64	52	.02	-1.70	.02	1	3	.0	0	9.9	ESE	29	SE	18	22	5	4	2.6	84	0
El Paso	3920	881.5	1008.5	94	71	82.5	+4.5	103	7	64	22	26	0	54	43	.72	-.98	.23	9	8	.0	0	9.2	SSE	35	SW	4	14	11	6	4.4	77	0
Fort Worth	688	990.9	1013.7	103	78	90.3	+7.6	107	16	71	22	31	0	64	51	.47	-2.15	.44	2	3	.0	0	12.3	S	43	SW	22	24	7	0	1.8	--	0
Galveston CO	7	---	---	90	80	85.4	+2.4	96	5	71	17	17	0	--	--	.38	-3.90	.33	3	--	.0	0	10.6	---	50	NE	17	--	--	--	---	87	0
Galveston	7	1014.6	1015.3	91	80	85.5	+2.5	97	5	71	17	21	0	77	80	1.61	-2.67	1.42	4	4	.0	0	11.9	SSE	--	---	--	20	8	3	3.4	--	0
Houston CO	41	1009.8	---	97	78	87.1	+3.9	102	4	72	18	30	0	--	--	1.54	-2.62	1.48	3	2	.0	0	8.7	---	43	E	17	12	16	3	4.3	89	0
Houston	41	1012.5	1014.9	96	75	85.8	+3.7	100	4	71	11	30	0	74	77	2.01	-.60	2.01	1	2	.0	0	10.6	S	--	---	--	11	18	2	4.3	--	0
Laredo	500	997.6	1012.6	101	77	89.0	+2.1	106	8	74	19	31	0	71	64	.43	-1.19	.41	3	3	.0	0	15.1	SE	--	---	--	17	10	4	3.8	--	0
Lubbock	3238	903.8	1012.4	92	67	79.9	+1.8	100	7	62	11	24	0	61	60	2.62	+.64	1.71	5	7	.0	0	10.3	S	32	SSW	31	19	8	4	3.3	--	0
Palestine CO	491	996.6	1013.9	99	77	88.1	+6.3	105	17	69	1	31	0	--	--	.07	-2.10	.06	2	2	.0	0	[illegible]	---	30	SE	19	19	10	2	3.0	92	0
Port Arthur CO	5	1013.5	---	94	79	86.5	+3.3	99	13	72	17	28	0	--	--	1.09	+4.93	.65	7	11	.0	0	10.1	---	57	NE	17	17	13	1	3.4	77	0
Port Arthur	5	1013.9	1014.8	96	74	85.3	---	101	13	69	17	30	0	75	81	1.07	---	.85	5	9	.0	0	7.5	SSW	--	---	--	15	14	2	3.9	--	0
San Angelo	1903	947.2	1012.8	98	73	85.1	+1.7	104	8	64	12	29	0	60	51	2.37	+.08	2.05	3	6	.0	0	9.4	S	30	ESE	18	22	6	3	2.8	--	0
San Antonio	782	989.5	1013.9	100	74	87.1	+3.6	104	5	69	12	30	0	66	58	.06	-2.36	.06	1	2	.0	0	8.6	SE	34	NE	18	21	9	1	2.5	90	0
Victoria	109	1009.8	1014.2	99	76	87.9	+3.1	105	17	72	12	31	0	73	73	.14	-2.72	.13	2	4	.0	0	7.9	SSE	37	SSE	8	18	11	2	3.4	--	0
Waco	[illegible]	995.3	1013.3	102	78	90.0	+4.6	106	5	74	24	31	0	66	53	.59	-1.74	.30	2	2	.0	0	10.6	S	--	---	--	21	10	0	2.2	--	0
Wichita Falls	1027	977.0	1012.3	101	76	88.4	+2.5	109	6	67	22	28	0	63	50	.51	-1.66	.47	4	4	.0	0	10.8	S	34	NE	10	23	6	2	2.5	--	0
UTAH																																	
Milford	5029	847.3	1013.5	88	55	71.3	+.4	97	16	44	26	14	0	44	45	1.06	+.41	.72	7	9	.0	0	8.9	SSW	--	---	--	13	13	5	4.0	--	1
Salt Lake City CO	4260	---	---	--	--	---	---	--	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	--	---	--	-	--	--	---	--	0
Salt Lake City	4222	866.2	1010.6	86	61	73.5	+.7	97	1	48	25	12	0	48	45	1.79	+.89	1.00	6	10	.0	0	7.3	SSE	45	W	19	14	12	5	4.2	74	1
VERMONT																																	
Burlington	398	1000.7	1015.0	75	56	65.2	-2.7	86	29	45	6	0	0	58	79	2.06	-1.31	.66	14	4	.0	0	7.3	N	27	NW	1	5	13	13	6.8	43	47
VIRGINIA																																	
Cape Henry CO	16	1014.2	1014.9	83	72	77.6	+.7	94	16	61	6	4	0	--	--	7.58	+2.72	3.45	12	8	.0	0	10.2	---	37	NW	3	12	10	9	4.9	73	0
Lynchburg	947	982.7	1016.1	86	64	75.5	+1.2	94	21	56	25	9	0	64	73	2.46	-1.32	.89	9	9	.0	0	---	---	40	SW	16	8	18	5	4.9	67	0
Norfolk CO	11	1012.2	---	85	72	78.3	+.9	96	1	65	6	9	0	--	--	8.68	+3.46	1.80	13	8	.0	0	7.9	---	29	N	3	--	--	--	---	61	0
Norfolk	25	1014.6	1015.6	84	70	76.9	+1.1	94	1	58	6	7	0	69	80	7.16	+1.94	1.59	13	8	.0	0	7.9	NE	--	---	--	11	8	12	5.4	--	0
Richmond CO	162	---	---	86	67	76.4	-.1	96	1	57	25	7	0	--	--	4.92	+.50	1.29	9	--	.0	0	---	---	--	---	--	--	--	--	---	--	0
Richmond	160	1009.8	1015.6	86	66	76.0	+.1	97	1	55	25	8	0	67	77	5.23	---	1.86	8	6	.0	0	6.0	NNE	25	NW	10	6	16	9	5.9	64	0
Roanoke	1192	974.6	1016.1	88	64	75.7	+1.2	95	10	55	26	13	0	63	70	1.63	-2.30	.72	8	5	.0	0	5.4	W	--	---	--	7	19	5	5.3	--	0
Washington CO	72	---	---	86	68	77.0	+2.0	96	30	57	24	11	0	--	--	2.02	-1.99	.89	6	5	.0	0	5.5	---	23	W	3	--	--	--	---	74	0
Wash. Nat'l.	14	1011.5	1015.9	85	68	76.8	+1.8	94	21	57	24	7	0	65	71	1.75	-2.26	.82	5	4	.0	0	7.2	S	28	NW	3	13	10	8	5.1	77	0
WASHINGTON																																	
Ellensburg	1727	952.3	1013.4	83	54	68.3	+1.5	95	2	44	31	7	0	45	48	.81	+.61	.50	4	3	.0	0	15.6	NW	--	---	--	23	4	4	2.3	--	46
Kelso	17	---	---	77	49	62.7	---	94	20	37	29	1	0	--	--	.41	---	.41	1	0	.0	0	---	---	--	---	--	13	11	7	4.6	--	89
North Head CO	194	1010.5	1018.0	63	53	57.9	+.3	69	4	50	24	0	0	--	--	.20	-.85	.09	6	0	.0	0	12.7	---	31	N	15	8	10	13	6.1	53	218
Olympia	190	1009.1	1016.8	77	47	62.0	---	92	21	40	29	1	0	50	72	.54	---	.54	2	1	.0	0	3.6	SSW	--	---	--	11	12	8	4.5	--	99
Port Angeles	11	1016.6	1017.6	62	50	56.0	---	78	20	45	24	0	0	51	84	.60	---	.60	2	1	.0	0	12.8	WNW	--	---	--	13	8	10	5.0	--	271
Seattle	14	1015.9	1016.8	--	--	---	---	--	--	--	--	--	-	52	68	---	---	---	--	--	---	-	7.6	NNW	--	---	--	--	--	--	---	--	---
Seattle CO	14	---	---	74	55	64.3	-.8	87	21	49	29	0	0	0	0	.71	+.01	.64	4	1	.0	0	6.8	---	26	NW	27	13	8	10	4.7	55	55
Spokane	2357	944.8	1012.8	82	55	68.3	+.2	97	2	45	31	7	0	41	41	.40	-.22	.38	4	0	.0	0	7.3	SW	22	SW	22	17	10	4	3.8	74	59
Stampede Pass CO	3960	880.8	1018.2	65	46	55.3	---	83	20	38	28	0	0	--	--	1.16	---	1.01	6	1	.0	0	12.7	---	29	W	11	16	9	6	3.6	--	304
Stevenson CO	319	---	---	76	56	65.6	---	96	20	45	29	3	0	--	--	.64	---	.64	1	0	.0	0	---	---	--	---	--	17	9	5	3.4	--	44
Tacoma CO	127	1009.8	1016.6	73	53	63.0	+.4	82	21	49	29	0	0	--	--	.49	-.25	.48	3	0	.0	0	5.6	---	22	N	°14	13	13	5	4.1	65	69
Tatoosh CO	101	1014.6	1018.0	58	50	54.1	-1.2	68	28	46	24	0	0	52	92	.21	-1.81	.06	10	1	.0	0	10.3	S	28	E	27	3	7	21	7.9	27	329
Walla Walla	1200	---	---	--	--	---	---	--	--	--	--	--	-	44	--	---	---	---	--	--	---	-	8.1	S	--	---	--	--	--	--	---	--	---
Walla Walla CO	949	977.7	1012.8	86	61	73.8	+1.1	98	21	50	31	13	0	--	--	.07	-.42	.05	2	0	.0	0	5.1	---	21	W	28	23	4	4	2.4	82	15
Yakima	1061	973.9	1012.3	87	51	68.9	-.3	97	21	41	29	16	0	44	43	.38	+.04	.27	3	1	.0	0	7.1	NNW	--	---	--	25	2	4	2.0	--	37
Seattle-Tacoma	379	1002.7	1017.1	73	50	61.7	---	85	21	44	29	0	0	50	69	1.02	---	.96	4	0	.0	0	7.8	SW	--	---	--	11	11	9	4.9	--	105
WEST VIRGINIA																																	
Charleston	950	981.7	1016.3	86	61	73.3	---	95	31	46	25	8	0	63	75	3.65	---	1.46	11	2	.0	0	5.5	S	•36	WNW	21	8	14	9	5.6	--	3
Elkins	1969	949.2	1017.1	80	54	67.3	-1.0	91	31	40	25	1	0	59	82	1.89	-1.97	.80	9	5	.0	0	2.8	WNW	23	NW	21	4	16	11	6.7	58	42
Huntington	565	---	---	88	62	75.2	+1.5	95	14	48	25	15	0	--	--	3.98	+.30	2.35	11	--	.0	0	---	---	--	---	--	--	--	--	---	--	0
Parkersburg CO	615	---	---	84	62	72.9	-1.0	92	2	49	25	8	0	--	--	1.02	-2.49	.37	7	4	.0	0	4.5	---	16	N	°3	12	7	12	5.4	68	3
Parkersburg	837	---	1016.1	--	--	---	---	--	--	--	--	--	-	61	--	---	---	---	--	--	---	-	5.1	SSW	--	---	--	--	--	--	---	--	-
Petersburg	1013	979.7	---	88	57	72.7	---	99	15	43	24	14	0	--	--	1.76	---	.76	10	3	.0	0	---	---	--	---	--	11	10	10	5.4	--	7
WISCONSIN																																	
Green Bay	689	990.5	1016.4	74	54	64.2	-3.5	85	28	40	4	0	0	58	83	5.50	+2.32	2.62	13	5	.0	0	7.5	NE	47	SW	2	7	9	15	6.6	50	76
La Crosse CO	---	---	---	--	--	---	---	--	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	--	---	--	--	--	--	---	--	20
La Crosse	669	990.9	1015.5	77	57	66.9	-2.5	88	28	49	23	0	0	60	79	3.29	-.42	.86	14	7	.0	0	7.8	E	25	NE	7	4	8	19	7.5	--	21
Madison CO	---	---	---	--	--	---	---	--	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	--	---	--	--	--	--	---	--	20
Madison	857	985.1	1016.5	78	56	67.0	-2.5	90	1	44	4	1	0	59	81	3.08	-.13	.95	11	9	.0	0	7.9	SSE	26	W	21	7	10	14	6.7	56	36
Milwaukee CO	---	---	---	--	--	---	---	--	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	--	---	--	--	--	--	---	--	22
Milwaukee	674	990.2	1016.0	75	59	67.0	-.6	87	31	48	24	0	0	60	82	2.56	-.10	.95	11	5	.0	0	8.6	SE	29	NE	3	9	7	15	6.2	49	33

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
WYOMING																																	
Casper	5322	838.8	1012.0	83	53	68.0	-1.5	92	1	42	15	3	0	42	45	0.10	-0.83	0.06	4	8	0.0	0	9.4	SW	--	----	--	12	13	6	4.5	—	21
Cheyenne	6139	814.4	1014.1	78	52	65.1	-.5	91	1	41	15	1	0	47	59	1.85	+.30	.49	10	13	T	0	10.2	W	35	N	14	10	11	10	5.4	55	57
Lander	5563	836.4	1013.7	82	52	66.9	+1.4	90	16	42	15	3	0	41	49	.48	-.05	.20	6	6	.0	0	7.9	——	47	W	11	12	12	7	4.7	69	26
Rock Springs	6741	797.2	1015.5	78	51	64.6	-1.5	87	16	42	25	0	0	39	46	.17	-.52	.14	4	10	.0	0	12.7	W	•46	NNW	8	8	13	10	5.4	—	56
Sheridan	3942	884.5	1013.6	83	53	67.8	+1.3	95	1	43	26	1	0	49	57	1.13	+.22	.75	11	13	.0	0	8.5	NW	50	NW	23	5	22	4	5.0	75	25
PACIFIC AREA																																	
Canton Island	9	1009.8	1010.2	91	79	84.6	——	97	3	74	25	17	0	75	78	3.81	——	1.46	14	1	.0	0	——	——	—	——	—	1	19	11	6.3	—	0
Hilo	25	1014.2	1015.8	83	69	75.5	——	85	15	64	26	0	0	69	82	10.21	——	1.40	25	0	.0	0	5.1	SW	25	SE	°6	3	13	15	7.1	38	0
Honolulu CO	12	——	——	83	74	78.5	+.1	87	15	71	31	0	0	--	--	1.06	-.22	.35	17	--	.0	0	——	——	--	——	--	--	--	--	——	—	0
Honolulu	7	1015.6	1016.2	85	74	79.7	——	89	15	72	17	0	0	67	68	1.14	——	.36	11	0	.0	0	12.1	ENE	31	NE	7	14	17	0	3.9	75	0
Lihue	115	1011.5	1016.7	84	73	78.4	——	87	12	69	24	0	0	70	77	2.14	——	.50	15	0	.0	0	11.3	NE	30	NE	28	5	21	5	6.0	64	0
Wake Island	9	1013.9	1014.2	89	79	83.9	——	91	23	76	2	4	0	75	76	1.51	——	.75	15	0	.0	0	12.0	ENE	--	——	—	17	14	0	3.9	—	0
Yap Island	51	1007.8	1009.5	87	76	81.4	——	93	17	72	27	9	0	--	--	16.47	——	2.97	27	4	.0	0	——	——	--	——	—	—	—	—	——	—	0
PUERTO RICO																																	
San Juan CO	47	——	——	——	—	——	——	—	--	—	—	--	-	--	—	——	——	——	--	--	——	-	——	——	—	——	--	--	—	—	——	—	0
San Juan	9	1012.5	1014.5	89	76	82.1	——	93	23	73	15	6	0	74	78	6.11	——	2.72	20	8	.0	0	10.8	ESE	37	E	15	9	14	8	5.4	71	0
ALASKA																																	
Anchorage	134	1011.2	1016.3	63	49	59.9	+.3	71	12	42	16	2	0	50	81	2.41	-.15	.71	17	0	.0	0	4.4	N	29	S	23	0	4	27	9.3	17	276
Annette Island	110	1015.0	1019.0	65	52	58.3	.0	79	29	45	31	4	0	51	80	4.88	-.31	2.54	9	0	.0	0	----	NW	•25	ESE	3	1	9	21	8.1	--	205
Barrow	22	1009.8	1010.2	49	38	43.3	+5.0	67	6	34	26	0	0	42	92	1.24	+.41	.37	20	0	.0	0	13.2	E	45	SW	12	0	2	29	9.4	—	649
Bethel	21	1008.8	1010.2	57	48	52.8	+.5	68	13	42	7	0	0	50	90	12.37	+8.35	2.40	29	0	.0	0	10.7	S	•30	SSE	21	0	1	30	9.8	—	371
Cordova	40	1015.2	1016.9	61	45	52.8	+.5	69	8	38	24	0	0	50	88	6.26	-3.32	1.43	25	0	.0	0	2.1	E	•17	ENE	13	1	2	28	9.2	—	371
Fairbanks	436	995.9	1012.9	70	46	57.8	+3.8	85	13	40	24	13	0	47	72	1.94	-.79	.93	11	0	T	0	4.9	E	•30	W	27	3	9	19	7.6	—	215
Galena	120	1005.8	1010.5	61	47	53.7	+.5	72	14	35	31	3	0	48	79	4.45	+1.66	.94	22	0	.0	0	10.4	SSE	•48	SW	27	0	4	27	8.7	--	341
Gambell	25	1007.1	1008.1	48	41	44.5	-1.2	54	°6	34	29	0	0	--	--	3.70	+1.58	.84	19	0	.0	0	14.6	SSW	38	SW	°7	0	5	26	9.1	--	627
Juneau	15	1017.4	1018.3	63	48	55.5	+2.7	76	10	41	27	7	0	51	82	2.76	-1.96	.59	18	0	.0	0	6.4	E	23	SE	20	3	3	25	8.3	25	289
Kotzebue	10	1008.1	1008.5	54	45	49.5	-.7	59	4	39	31	0	0	46	86	5.18	+3.45	.94	21	0	.0	0	16.0	SE	--	----	--	1	4	26	8.9	—	474
McGrath	334	999.3	1011.9	63	48	55.1	+1.7	81	14	37	1	5	0	50	83	5.46	+1.94	1.13	24	1	.0	0	5.6	S	•43	S	21	1	2	28	9.3	—	297
Nome	13	1007.8	1008.5	53	42	47.3	-2.2	59	°2	30	30	0	1	45	89	7.82	+4.60	1.39	22	0	.0	0	10.2	SW	36	SW	22	2	5	24	8.5	--	545
Northway	1713	951.9	1014.6	70	45	57.4	+4.2	82	11	39	24	14	0	45	67	.59	-1.40	.25	10	2	.0	0	3.3	SE	--	----	--	1	11	19	8.1	—	341
St. Paul Island	22	1009.0	1010.2	52	45	48.9	+1.5	57	22	41	22	0	0	48	93	3.57	+.41	.89	23	0	.0	0	----	----	--	----	--	0	4	27	9.5	—	492
Umiat	337	1004.0	1013.2	59	40	49.5	+2.9	77	12	28	24	5	5	42	79	2.26	+.53	.77	15	0	T	••0	6.9	E	•23	W	°12	2	4	25	8.8	--	476
Wales	9	1007.8	1008.5	48	40	44.0	-2.1	52	26	35	30	0	0	--	--	3.62	+1.13	1.57	11	0	.0	0	----	----	--	----	--	2	2	27	----	—	628
Yakutat	28	1017.3	1018.3	60	49	54.3	+1.3	68	13	42	9	0	0	51	90	4.06	-7.11	1.00	17	0	.0	0	5.9	E	•25	ESE	14	1	5	25	8.9	--	333
PACIFIC AREA																																	
Koror (July)	117	1005.4	1008.2	88	75	81.6	——	93	20	72	15	9	0	--	—	9.51	——	1.11	27	0	.0	0	----	----	--	----	—	—	—	—	----	—	0
Ponape (July)	109	1006.1	1011.1	88	75	81.4	——	91	1	73	20	9	0	--	--	14.39	——	2.48	25	2	.0	0	----	----	--	----	—	—	—	—	----	—	0

Data from airport unless otherwise specified. CO indicates data from city office.

* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

** Melted as it fell.

° Other dates also.

DEGREE DAYS

Table 3

AUGUST 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	0	0	0
Mobile (CO)	0	0	0
Mobile	0	0	
Montgomery (CO)	0	0	0
Montgomery	0	0	0
ARIZONA			
Flagstaff	91	95	109
Payson (CO)	18	18	
Phoenix (CO)	0	0	0
Phoenix	0	0	
Prescott	16	16	
Tucson	0	0	
Winslow	4	4	
Yuma	0	0	0
ARKANSAS			
Ft. Smith	0	0	0
Little Rock	0	0	0
Texarkana	0	0	
CALIFORNIA			
Bakersfield	0	0	0
Beaumont (CO)	6	6	
Bishop	1	1	2
Blue Canyon	54	87	
Burbank	2	2	
Eureka (CO)	286	565	550
Fresno	0	0	0
Los Angeles (CO)	1	1	1
Los Angeles	1	4	
Mt. Shasta (CO)	40	64	
Oakland	60	173	148
Red Bluff	0	0	0
Sacramento (CO)	1	3	3
Sacramento	0	1	
Sandberg (CO)	23	24	
San Diego	0	0	7
San Francisco (CO)	232	498	381
San Francisco	108	297	258
San Jose	3	25	
Santa Catalina	43	104	
Santa Maria	86	204	
COLORADO			
Alamosa	65	75	
Colorado Springs	28	44	
Denver	12	29	16
Grand Junction	0	0	2
Pueblo	6	6	6
CONNECTICUT			
Bridgeport	1	1	
Hartford	5	5	18
New Haven	3	3	13
DELAWARE			
Wilmington	2	2	
DIST. OF COLUMBIA			
Washington (CO)	0	0	2
Washington	0	0	
FLORIDA			
Apalachicola	0	0	0
Daytona Beach	0	0	
Fort Myers	0	0	0
Jacksonville (CO)	0	0	0
Jacksonville	0	0	
Key West (CO)	0	0	0
Key West	0	0	
Melbourne	0	0	
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	
Miami Beach	0	0	
Orlando	0	0	
Pensacola (CO)	0	0	0
Tallahassee	0	0	
Tampa	0	0	0
West Palm Beach	0	0	
GEORGIA			
Albany	0	0	0
Atlanta (CO)	0	0	0
Atlanta	0	0	
Athens	0	0	
Augusta	0	0	0
Columbus	0	0	
Macon	0	0	0
Rome	0	0	
Savannah	0	0	0
Valdosta	0	0	
IDAHO			
Boise	23	24	26
Lewiston	27	37	
Pocatello	31	43	33
ILLINOIS			
Cairo (CO)	0	0	0
Chicago (CO)	2	2	13
Chicago	4	4	
Chicago University	6	11	
Joliet	10	13	
Moline	4	7	
Peoria	2	3	9
Springfield (CO)	0	0	3
Springfield	0	0	
INDIANA			
Evansville	0	1	1
Ft. Wayne	16	16	18
Indianapolis (CO)	0	0	5
Indianapolis	1	1	
South Bend	24	26	
Terre Haute	0	0	
IOWA			
Burlington	1	2	5
Charles City (CO)	20	34	32
Davenport (CO)	0	0	8
Des Moines	4	7	10
Dubuque	19	36	16
Keokuk (CO)	4	6	4
Sioux City	5	22	17
KANSAS			
Concordia (CO)	0	0	4
Dodge City	4	4	4
Goodland	6	30	7
Topeka (CO)	0	0	2
Topeka	0	0	
Wichita	0	0	0
KENTUCKY			
Lexington	0	0	4
Louisville (CO)	0	0	1
Louisville	0	0	
LOUISIANA			
Baton Rouge	0	0	0
Lake Charles	0	0	
New Orleans (CO)	0	0	0
New Orleans	0	0	
Int.Airport,Moisant	0	0	
Shreveport	0	0	0
MAINE			
Caribou	108	185	
Eastport	97	174	297
Portland	31	41	76
MARYLAND			
Baltimore (CO)	0	0	1
Baltimore	0	0	
Frederick	3	3	
MASSACHUSETTS			
Boston	3	3	22
Milton	22	26	
Nantucket	4	4	31
Pittsfield	71	92	
MICHIGAN			
Alpena (CO)	85	129	128
Detroit	14	15	24
Escanaba (CO)	116	164	140
Grand Rapids (CO)	13	13	28
Grand Rapids	32	40	
Lansing	37	42	54
Marquette (CO)	156	236	184
Muskegon	46	60	
Sault Ste. Marie	162	282	197
Ypsilanti	14	15	
MINNESOTA			
Duluth (CO)	197	290	165
Duluth	180	268	
International Falls	168	249	
Minneapolis	19	24	31
Rochester	38	50	
St. Cloud	53	69	71
St. Paul	23	24	33
MISSISSIPPI			
Jackson	0	0	0
Meridian	0	0	0
Vicksburg	0	0	0
MISSOURI			
Columbia	0	4	4
Kansas City	0	1	0
St. Joseph	0	2	3
St. Louis (CO)	0	0	1
St. Louis	0	1	
Springfield	0	0	3
MONTANA			
Billings	45	99	
Butte	230	363	
Glasgow (CO)	62	88	
Great Falls	136	197	
Havre (CO)	90	118	79
Helena	112	168	107
Kalispell	139	216	168
Miles City	20	65	
Missoula	83	150	94
NEBRASKA			
Grand Island	1	20	
Lincoln (CO)	1	4	6
Lincoln	2	9	
Norfolk	5	26	
North Platte	9	46	14
Omaha	1	6	6
Scottsbluff	16	43	
Valentine (CO)	19	72	28
NEVADA			
Elko	50	71	
Ely	48	52	
Las Vegas	0	0	
Reno	37	52	29
Tonopah	3	3	
Winnemucca	42	47	33
NEW HAMPSHIRE			
Concord	47	56	66
Mt. Washington	572	1076	
NEW JERSEY			
Atlantic City	1	1	3
Newark	0	0	7
Trenton	1	1	6
NEW MEXICO			
Albuquerque	0	0	0
Clayton	9	9	0
Roswell	0	0	0
Raton	13	16	
NEW YORK			
Albany	17	18	21
Bear Mountain (CO)	24	29	
Binghamton	64	84	53
Buffalo	22	28	39
New York (CO)	0	0	5
La Guardia Field	0	0	
Oswego	37	40	53
Rochester	28	35	36
Syracuse	38	41	44
NORTH CAROLINA			
Asheville (CO)	0	0	6
Asheville	0	0	
Charlotte	0	0	1
Greensboro	0	0	2
Hatteras	0	0	0
Raleigh (CO)	0	0	1
Raleigh	0	0	
Wilmington (CO)	0	0	0
Winston-Salem	0	0	
NORTH DAKOTA			
Bismarck	67	100	63
Devils Lake (CO)	89	135	115
Fargo	56	91	65
Grand Forks	64	99	92
Pembina	84	127	
Williston (CO)	81	119	87
OHIO			
Akron	29	38	26
Cincinnati (CO)	0	0	4
Cincinnati	0	0	
Cleveland (CO)	12	13	21
Cleveland	14	14	
Columbus	8	8	8
Dayton	1	1	9
Sandusky (CO)	3	3	11
Toledo	21	21	21
Youngstown	31	38	
OKLAHOMA			
Oklahoma City (CO)	0	3	0
Oklahoma City	0	2	
Tulsa	0	0	
OREGON			
Baker (CO)	80	115	126
Burns (CO)	59	74	
Eugene	44	58	
Meacham	124	203	
Medford	19	26	18
Pendleton	18	26	
Portland (CO)	24	42	55
Portland	43	58	
Roseburg (CO)	18	28	49
Salem	52	72	
Sexton Summit (CO)	83	152	
Troutdale	42	72	
PENNSYLVANIA			
Allentown	13	13	
Curwensville	75	113	
Erie (CO)	17	17	24
Harrisburg	5	5	7
Park Place	42	56	
Philadelphia (CO)	0	0	2
Philadelphia	0	0	
Pittsburgh (CO)	3	4	8
Pittsburgh	12	15	16
Reading (CO)	0	0	6
Scranton (CO)	23	24	27
Williamsport	13	13	22
RHODE ISLAND			
Block Island	1	1	19
Providence (CO)	2	2	20
Providence	6	6	
SOUTH CAROLINA			
Charleston (CO)	0	0	0
Charleston	0	0	
Columbia (CO)	0	0	0
Columbia	0	0	
Florence	0	0	
Greenville	0	0	1
Spartanburg	0	0	
SOUTH DAKOTA			
Huron	28	45	30
Pierre	15	42	15
Rapid City	19	71	43
Sioux Falls	18	40	
TENNESSEE			
Bristol	0	0	
Chattanooga	0	0	0
Knoxville	0	0	0
Memphis	0	0	0
Nashville	0	0	0
TEXAS			
Abilene	0	0	0
Amarillo	0	0	3
Austin	0	0	0
Big Spring	0	0	0
Brownsville	0	0	0
Corpus Christi	0	0	0
TEXAS (Cont'd.)			
Dallas	0	0	0
Del Rio (CO)	0	0	0
El Paso	0	0	0
Ft. Worth	0	0	0
Galveston (CO)	0	0	0
Galveston	0	0	
Houston (CO)	0	0	
Houston	0	0	0
Laredo	0	0	
Lubbock	0	0	
Palestine (CO)	0	0	0
Port Arthur (CO)	0	0	0
Port Arthur	0	0	
San Angelo	0	0	
San Antonio	0	0	0
Victoria	0	0	
Waco	0	0	
Wichita Falls	0	0	
UTAH			
Milford	1	1	
Salt Lake City (CO)	0	0	7
Salt Lake City	1	1	0
VERMONT			
Burlington	47	53	65
VIRGINIA			
Cape Henry	0	0	0
Lynchburg	0	0	3
Norfolk (CO)	0	0	0
Norfolk	0	0	
Richmond (CO)	0	0	1
Richmond	0	0	
Roanoke	0	0	4
WASHINGTON			
Ellensburg	46	73	
Kelso	89	158	
North Head (CO)	218	420	435
Olympia	99	160	
Port Angeles	271	518	
Seattle (CO)	55	80	92
Spokane	59	82	57
Stampede Pass (CO)	304	554	
Stevenson (CO)	44	80	
Tacoma (CO)	69	107	146
Tatoosh Island (CO)	329	615	595
Walla Walla (CO)	15	16	14
Yakima	37	52	26
WEST VIRGINIA			
Charleston	3	3	
Elkins	42	56	39
Huntington	0	0	
Parkersburg (CO)	3	3	5
Petersburg	7	11	
WISCONSIN			
Green Bay	76	106	55
La Crosse (CO)	20	25	29
La Crosse	21	24	
Madison (CO)	20	26	28
Milwaukee (CO)	22	33	34
Milwaukee	33	44	
WYOMING			
Casper	21	68	
Cheyenne	57	122	83
Lander	26	77	70
Rock Springs	56	91	
Sheridan	25	85	
ALASKA			
Anchorage	276	446	
Annette Island	205	416	
Barrow	649	1291	1618
Bethel	371	732	720
Cordova	371	650	
Fairbanks	215	368	509
Galena	341	580	
Gambell	627	1258	
Juneau	289	435	
Kotzebue	474	886	
McGrath	297	517	
Nome	545	1034	960
Northway	341	455	
St. Paul	492	1045	
Umiat	476	2178	
Wales	628	2147	
Yakutat	333	634	

Data from airport unless otherwise specified. CO indicates data from city office.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Webster, Mont.	1	Noon	*2	11				Slight	Hail	
Richardton (2 miles southwest of), N. Dak.	1	Afternoon						See remarks	do	Severe hailstorm caused losses up to 60 percent.
Velva (near), N. Dak.	1								do	Heavy hailstorm 4 to 8 miles south of Velva.
Albuquerque, N. Mex.	1						$54,800		Rains	Flash floods in arroyos damaged property in northern part of City.
Tucson, Ariz.	2	12:30–3 a.m.	*10				°50,000	°	Electrical and rain	Heavy thunderstorm with frequent lightning and heavy rain. Some flood damage to stalled autos and a few houses in low areas. Destruction of 2 new power substations struck by lightning principal damage.
Denver and vicinity, Colo.	2–3	3 p.m., 2d–8 a.m. 3d					500,000	$25,000	Rain	Heaviest precipitation in many years. Cherry Creek bankfull; many small streams overflowed; many sections flooded; local transportation halted; shops, homes, and basements inundated; hundreds of persons stranded; scores evacuated.
Doniphan County, Kans.	2	7:30–9 p.m.	*2	20			400	12,500	Hail and wind	Storm path from county line northwest of Highland southeastward. One barn roof blown off. Corn damaged up to 75 percent.
Utah, particularly Great Salt Lake Valley and adjacent Wasatch slopes	2–5						See remarks		Thundershowers	Thundershowers with record-breaking intensities occurred during period, causing flash floods at mouths of numerous canyons leading out of Wasatch Mountains. Many points along highways covered with flood waters, and in several cases the flow of rocks and mud sufficient to halt traffic. In towns, particularly Ogden and Salt Lake City hundreds of basements flooded and streets damaged considerably. Grain knocked down, and cut hay ruined. $50,000 damage to Structural Steel and Forge Company in Salt Lake City. Thousands of urban residents, business concerns, and farmers sustained damage of a lesser nature.
Wickenburg-Gila Bend-Florence triangle, Ariz.	3	Night of 2d and most of 3d	*80	80			41,150	42,000	Electrical, wind, and rain	A series of heavy thunderstorms. Major damage caused by flash flooding from heavy rains. Two-day rainfall totaled from 1.00 to 2.50 inches in area affected. Road washouts, broken canals and laterals, and some flooding of lowlands between Tolleson and Buckeye occurred. Luke Air Force Base received some sheet flooding from desert floor and White Tank Mountain area. Approximately 6,700 acres of cotton land temporarily inundated, with minor resulting damage. Damage by wind approximately $8,000; lightning, $1,000; rain, $74,150.
Doniphan County, Kans.	3	Early a.m.					1,500		Electrical	Severe electrical storm in Wathena area. Lightning struck and burned garage and contents of pickup truck and garden and carpenter tools; struck substation south of Troy; started fire in kitchen wall of home; killed 4 cows; struck 51 trees and transformers.
Blythewood, S. C.	3	3:30–4 p.m.			2				do	Two children killed by lightning.
Prescott (near), Ariz.	3	4:20–5:45 p.m.			0	0	0	0	Tornado	A tornado cloud observed about 15 miles east-northeast of Prescott Airport in vicinity of Mingus Mountains. Movement was from east-northeast to northwest. Path over range land. It seemed to be of moderate size and intensity. Cone seemed to touch ground several times before it dissipated.
Ouray, Colo.	3		100–300	10			30,000		Rain	A severe downpour south of Ouray caused high water through town, resulting in damage to trees, lawns, buildings, and roads.
Chesterfield County, Va.	4	Afternoon					34,000		Electrical	Several homes set afire and others damaged by lightning in Colonial Heights and near Ettrick and Matoaca.
Arco, Butte County, Idaho	4	3:30 p.m.					35,000		Rain and electrical	A "cloudburst" in nearby foothills caused flash flood in Arco, with damage to Arco Canal banks estimated at $20,000 and to stored wheat estimated at $15,000. Streets flooded. A mud slide covered an automobile. Lightning set fire to a house, but rain put out the fire.
Espanola, N. Mex.	4						28,150		Rains	Flash floods damaged homes in City.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Mud Lake (vicinity of), Jefferson County, Idaho	5	2-4 p.m.	*3	10			$1,200	$125,000	Hail	Hailstones 3/8 to 3/4 inch in diameter destroyed an estimated 70 to 100 percent of crops in area of 6,000 to 8,000 acres, and 10 to 70 percent in area of 10,000 to 12,000 acres. Crops destroyed or damaged included wheat, oats, barley, alfalfa seed, garden vegetables, and fruit. Property damaged was windows, roofs, and temporary shelters.
Bozeman, Mont.	5	3:45 p.m.	880	1½				5,000	do	
Maricopa, Ariz.	5	Night 5-6	*5	5			°6,000	°	Rain	Heavy thundershowers south of Maricopa resulted in flash flooding of Santa Cruz River bottomland in vicinity of Maricopa. Approximately 4,000 acres of cotton land flooded, with only minor damage; 4 dwellings located in bottomlands flooded. Communications and utilities disrupted as pole lines were undermined by water; some fell, breaking wires.
Waukon-Harper's Ferry area, Iowa	5-6	Near midnight 5th-early a.m, 6th					See remarks		Rain and winds	Estimated damage to business establishments and numerous basements in Waukon alone $60,000. Bridges over small creeks and railroad tracks washed out. Two railroad bridges north of Harper's Ferry swept away. Small streams overflowed their banks temporarily, as a result corn and grain fields flattened and washed away. Waukon official rain 5.16 inches in approximately 4 hours. Harper's Ferry unofficial rain 6.50 inches, with most of it falling in 1 hour.
Colorado Springs (12 miles south of), Colo.	6	2 p.m.			2	1			Electrical	Two men killed and 1 injured when struck by lightning.
Montgomery, Ala.	6	3 p.m.					3,000		Thunderstorm	Weather Bureau Airport Station reported gusts at 75 m.p.h. and the Control Tower gusts at 92 m.p.h. Several large trees uprooted; small outbuildings demolished; billboards and signs blown down.
Ford County, Kans.	6	Afternoon			0	0	See remarks	0	Tornado	Small twister in southeastern Ford County lifted car from road and set it down in ditch without injury to occupants or car; also, tore down trees in northwestern part of Bucklin.
Hailey (near), Blaine County, Idaho	6	Afternoon					See remarks		Rain	Four small bridges washed out and about 1 mile of road damaged in Camp Creek Canyon, 12 miles west of Hailey.
St. Anthony (vicinity of), Fremont County, Idaho	6	4 p.m.						60,000	Hail and rain	Damage to grain and potatoes heaviest in Parker and Egin Bench areas, with damage to flower and vegetable gardens extending into St. Anthony. Hailstones estimated 3/8 inch in diameter.
Newkirk, Kay County, Okla.	6	5 p.m.						500	Wind	Wind from southwest. Damage to automobiles and utilities from falling trees. Damage to race track enclosure.
Tazewell County, Va.	6						1,500		Rain	A small church washed from its foundation and a bridge over creek blocked by debris at Bishop.
Barton County, eastward through Franklin County, Kans.	6-7	Late evening-3:30 a.m.		200			11,800		Electrical and wind	Severe electrical and windstorm moved from Barton County just before midnight to Franklin County about 3:30 a.m. Wind damage greatest in and near McPherson where a 55,000-barrel oil storage tank was blown in, a section of hangar roof blown away, and a plane damaged. Power lines suffered throughout area from both wind and lightning. Additional lightning damages included 5 head of cattle killed in Barton County (one valued at $800-$900); 3,000 bales of alfalfa hay burned, and minor damage to hospital chimney and to house in Ellsworth County; home burned in Rice County; and 6 head of cattle killed in Anderson County.
Hickman, Ky.	7	3 p.m.					5,000	1,000	Wind, rain, and electrical	One house badly damaged. Branches from trees blown down. Some damage to roofs. Power and telephone lines temporarily out of order.
Morton County, Kans.	7	5 p.m.			0	0	200	10,000	Hail, wind, and tornado	Hail, accompanied by wind, did extensive damage to several hundred acres of sorghum on at least 5 farms south of Wilburton. A small tornado destroyed chicken houses and other small outbuildings on 1 farm, wrecked a granary and moved 2 others off foundations on another farm.
Minnesota, extreme southeastern counties	7	5-8 p.m.					1,000		Electrical	A number of places struck by lightning. In Minneapolis, a 60-foot chimney partly wrecked after being struck.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Minnesota, extreme southeastern counties	7	5–8 p.m.					$75,000	$25,000	Rains	Excessively heavy rains, accompanying a severe thunderstorm, flooded many basements, streets, roads, and highways. Lowlands inundated. Much soil erosio Storm sewers backed up. Traffic delayed. Street cars derailed. Growing crops lodged, washed out, or drowned.
Rice and Steele Counties, Minn.	7	5:45 p.m.	880	12			100,000	See remarks	Wind, rain, and hail	A number of barns, outbuildings, silos, and windmills demolished; houses, barns, farm machinery, and automobiles damaged; plate glass windows broken; poles and wires downed; an airplane on ground damaged; many trees uprooted; some livestock and much poultry perished; growing crops damaged; grain shocks and haystacks scattered. Storm assumed tornadic proportions between Medford and Morristown; moved southeastward. Heavy to excessive rains and hail accompanied storm.
Rice and Steele Counties, Minn.	7	5:45 p.m.	880				20,000	30,000	Hail	Moderate to heavy hail, accompanying a severe thunderstorm, caused considerable damage to real property and growing crops. Some hailstones reported to be size of baseballs. Also, jagged chunks of ice reported to have fallen in spots. Much damage to greenhouses. Storm moved southeastward.
Las Animas area, Colo.	7	6–7:55 p.m.	•4	45			25,000	8,500	Hail and wind	Storm extended from near LaJunta to Caddoa area. Hail damage mostly in eastern portion of storm area. High winds, reaching near 70 m.p.h., caused greatest damage to crops, transmission lines, and buildings in western section.
Norton, Graham and Trego Counties, Kans.	7	7 p.m.–midnight			0	0	See remarks	See remarks	Wind, hail, and tornado	Wind and hail caused heavy loss to corn and late feed crops in western Norton County, then moved southward. Wind did considerable damage in Graham County, with some evidence of twister on 1 farm. In southern Trego County a tornado developed about 9:30 p.m., uprooting many trees and damaging buildings on several farms. Another funnel-shaped cloud sighted in Wakeeney area about midnight, but did not drop to ground. Hail also caused some crop damage in Trego County.
Coffee County, Kans.	7	Evening					7,500		Electrical	Large barn, 4 calves, and some hay in Burlington area burned to ground after being struck by lightning. Unoccupied house also burned.
Barton and Rice Counties, Kans.	7–8	11 p.m.–5 a.m.					90,000		do	Warehouse with contents of sacks, motors, and other equipment burned; chicken house and 350 chickens burned; house damaged—all from lightning in or near Sterling. House burned to ground west of Lyons. Oil tank destroyed and other minor damage in Barton County.
Spink, Hand, and Beadle Counties, S. Dak.	7						14,000	50,000	Hail	Large hail destroyed crops in scattered locations in these Counties.
Dukes County, Mass.	8	A.m–p.m.							Rain	At Edgartown, a rainfall of 5.42 inches flooded streets, cellars, and lowlands. Absence of any important streams precludes great flood damage.
Paris, Ky.	8	P.m.			1				Electrical	Fatality caused by being struck by lightning.
Vanceburg, Ky.	8				1				do	Fatality caused by being struck by lightning.
Bayard (near), Nebr.	8	2:40–3:10 p.m.	440	3	0	0	5,000	10,000	Tornado and hail	
Arcadia (near), Nebr.	8	3–5 p.m.	•2–5	4				Heavy	Hail	Crop damage heavy locally.
Ashton (near), Nebr.	8	4 p.m.	•6	9			Little	3,000	do	
Elba to Palmer, Nebr.	8	4:30 p.m.	•5	10		20	4,000	40,000	Hail and wind	
Merrick County, Nebr.	8	6–6:15 p.m.	•10	10			Little	900,000	do	
Kansas, northeastern portion	8	8–9 p.m.	•3–10	90			20,000	750,000	Wind, hail, and electrical	Severe hail and windstorm quite destructive from Marshall County through Nemaha, northern Jackson, Brown, Doniphan, and Atchison Counties. Wind broke windows, damaged barns and roofs, and disrupted power lines in many localities. Hail damage extensive to crops, and several hundred turkeys killed. Lightning struck hay bunk in feed lot of Marysville Sales Barn.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Platte and Buchanan Counties, Mo.	8	9:30-11:30 p.m.	*10	25			Slight	$80,000	Hail	Tobacco crop worst hit by hail which reached size of golf balls. In Platte County area most affected was from Iatan south to Weston, and Edgerton south to Ridgley, a 5 mile wide strip across County. In Buchanan County path lay from Rushville to Dearborn. One estimate of total damage was $500,000.
Southern McPherson and eastern Reno Counties, eastward to Greenwood County, Kans.	8-9	10 p.m.-2:30 a.m.					$60,000	50,000	Wind and hail	Severe windstorm covering an extensive area in central Kansas tore limbs from trees and damaged barns and other outbuildings, particularly in southern McPherson, Reno, Harvey and Sedgwick Counties, and disrupted power lines in many areas. Hail damaged corn, fruit, and windows near Marion-Butler County line and in Greenwood County northwest of Eureka.
Carroll and Ray Counties, Mo.	8-9	11 p.m.-1 a.m.					5,000		Wind and rain	In Ray County near Camden a garage blown away, tearing top from car and hitting and damaging one side of a house. Communities affected besides Camden were Orrick, Richmond, Hardin, Lexington, and Henrietta. In Carroll County farm buildings damaged southwest of Carrollton, as well as near Bogard, Lina, and Bosworth. Rain in excess of 4 inches in both Counties. About 1,000 sparrows were drowned.
Birmingham, Ala.	8					2	See remarks		Electrical	Two women slightly injured as lightning bolt struck a streetcar during a sharp thunderstorm. A home also struck.
Osage County, Kans.	9	3:30 a.m.					7,000		do	Fire from lightning seriously damaged interior of new grocery store in Overbrook.
Jefferson County, Kans.	9 (about)						2,500		do	Eleven head of cattle killed by lightning, exact date of strike unknown. Loss occurred 5 miles northeast of Winchester.
Jefferson County (northern portion), Kans.	9							See remarks	Hail	Heavy hail caused considerable damage to corn.
Ridgeland (near), S.C.	9	Afternoon			1		2,000		Wind	Heavy squall hit light plane while landing. Plane wrecked, and pilot killed.
Fayette, Clark, Powell, and Menifee Counties, Ky.	9	3-6 p.m.			2	4	7,500	72,500	Wind, rain, and electrical	Seventy-five to 90 percent of damage caused by wind. Tobacco hardest hit. Hail reported in some sections. Some farm buildings damaged, trees broken, and roofs blown off. Utility services disrupted in most areas.
Molt, Mont.	9	4 p.m.	1,760	5				2,000	Hail	
Maysville, Ky.	9				1				Electrical	Fatality caused by being struck by lightning.
Louisville and Jefferson County, Ky.	9	P.m.			1	2	50,000		Wind, rain, and electrical	Death and injuries due indirectly to storm. Winds reaching 50 m.p.h. caused greatest damage. Traffic snarled and utilities interrupted.
Northern Berkshire County, Mass.	9	7:30-8 p.m.						Minor	Hail	Minor damage in Pittsfield. Hailstones ½-inch in diameter.
Bardstown, Ky.	9						°25,000	°	Wind and electrical	Most damage caused by wind. Houses unroofed. Falling trees resulted in much wire trouble. Utilities disrupted. Tobacco and corn chief crops damaged.
Hickory, Catawba County, N. C.	"		100	½	0	0	10,000		Tornado	Destroyed grandstand at ball park, and uprooted about 200 trees.
Harvey County, Kans.	10	Early a.m.					50,000		Electrical	Lightning caused fires in Newton at Newton Appliance Company and to electric motor at flour mill.
Oklahoma, Logan, Payne, Pawnee, and Osage Counties, Okla.	10	12:40-5 p.m.	*10	75	0	3	55,000	4,000	Tornado, wind, and rain	Squall line formed for about 75 miles from northern Oklahoma County through Logan, Payne, Pawnee, and into Osage Counties. Heavy rains in northern Oklahoma and parts of Logan Counties. Station 2 miles east of Britton received 3.75 inches between 12:40 and 2 p.m. Heavier rains reported unofficially at Seward, Logan County. Tornado at Meridian, Logan County, at 1:57 p.m.; path about 200 yards wide, 5 miles long; traveled north-northeastward; 2 injuries; $20,000 damage to buildings, $2,000 to crops. High wind damage especially at Perkins, Cleveland, and Hominy; estimated property damage $35,000; crop damage $2,000. One person injured by high wind at Perkins.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Richmond and vicinity, Va.	10	1–2 p.m.					See remarks		Electrical and wind	Considerable damage to power lines in Ginter Park and Barton Heights sections of City and Eanes Lane section of Henrico County. One house set afire by lightning, gutting a downstairs bedroom and scorching other rooms. Ten other places struck, but only minor damage. Two trees uprooted and several felled or damaged by lightning.
Capulin (6 miles southeast of), N. Mex.	10	2:30 p.m.	30	14	0		Slight	Slight	Tornadoes	Observer saw three funnel-shaped clouds, two of which reached the ground. A distinct circular motion; considerable dust and debris picked up. Storm traveled east-northeastward over open country; only damage was to fences which were torn down. Some hail accompanied storm.
Tulsa, Okla.	10	3:40–4:25 p.m.				1	$9,000		Wind and electrical	Squall line moved eastward across County. Most of property damage from lightning. Injury from debris flying in high wind.
Buffalo, Wyo.	10	Afternoon					Light	$15,000	Hail	
Ayden, Pitt County, N. C.	10	Afternoon			1				Electrical	Woman killed by lightning.
Dean, Hockley County, Tex.	10	4:15 p.m.	*3	7			See remarks	1,500,000	Wind and hail	Damage 21 miles west of Lubbock. About 10,000 to 12,000 acres of cotton shredded. Hail as large as hens' eggs, and as deep as 3 feet in drifts in some places. Wind destroyed an empty warehouse; amount of damage unknown.
Northern Bristol County, Mass.	10	6–7 p.m.				4	4,000		Wind and rain	Most of damage by the thunderstorm in Attleboro. Many trees toppled; windows blown in; streets and cellars filled; slight injury to 4 persons from flying glass or limbs.
Cheyenne County, Kans.	10	6:30 p.m.	250	3	0	0	10,000		Tornado	Tornado came to ground 3 times as it moved eastward, damaging barn, windmills, and windows of house. Path of storm originated about 10 miles northeast of St. Francis.
Smith County, Kans.	10	Night					400		Electrical	Stack of 425 bales of alfalfa hay destroyed by fire caused by lightning 3 miles southwest of Gaylord.
Cheraw (near), S. C.	11	Afternoon			1				do	Soldier killed by lightning.
New Orleans, La.	11	Afternoon			1				Heat	Man died from heat exhaustion.
Thomasville, Davidson County, N. C.	11	Afternoon			1	5			Electrical	Man killed while sitting under tree; 5 others shocked slightly.
Dunn, Harnett County, N. C.	11	Afternoon						10,000	Hail	About 20 acres of tobacco destroyed in rural area of Dunn.
Belmont (near), Mont.	11–13	Afternoon					Considerable	Considerable	do	Hail on 2 separate days damaged a total of 1,500 acres of crop land, 400 acres of this a total loss.
Cut Bank (near), Mont.	11–12	Afternoon	880	30				35,000	do	Three different storms on 2 days damaged 3,000 acres of crops.
Fayetteville, Cumberland County, N. C.	11	5 p.m.			1				Electrical	One person killed by lightning.
Lodge Grass, Mont.	11	5–8 p.m.	1,760	100				Severe	Hail	Damage to wheat, alfalfa, and corn. Two separate storms on this date.
Roberts, Mont.	11	7 p.m.	*3–5	40				30,000	do	Hailstones marble to pullet egg size. Damage mostly to wheat.
Santa Rosa, N. Mex.	11	7:35 p.m.					1,000		do	Some damage to neon signs and windows.
Hammonton, N. J.	11	P.m.					1,000	5,000	Rain	Minor crop and property damage due to flooding.
Tinton, and Black Hills area, S. Dak.	11	Night	See remarks	See remarks			100,000		Electrical and wind (tornadic)	Tornado proportions. Lightning caused 9 fires which ruined 5,000 acres of forest. Wind near Tinton uprooted trees or broke off trees at height of 8 feet above ground in a path 2 miles wide and 8 miles long.
Conrad, Mont.	12–13	4 p.m. 4:30–5:30 p.m.	*5	25				Severe	Hail	There was one storm on 12th and 2 separate storms on 13th.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ethridge-Shelby-Kevin-Oilmont-Ferdig area, Mont.	12-13	4:30 p.m.	•1½	4				$10,000	Hail	Hail in about same area on 2 days; crop damage varied from very light to severe.
Turner, Mont.	12	5:30 p.m.	•3	22			Slight	25,000	do	Hailstones pea to golf ball size. Two separate storms.
Harlem, Mont.	12	6 p.m.	•30	45			Slight	Considerable	do	
Lost Lake, Mont.	12	Evening	1,760					Heavy	do	Damage mostly to wheat.
Richmond and vicinity, Va.	12	7-8 p.m.					$3,200		Electrical	Slight damage in City, mostly to power lines. A garage in Sandston struck by lightning and badly damaged by subsequent fire. Two 3,000 volt fuses blown out, disrupting electric service to rural areas for about 1 hour.
Phillips County, Kans.	12	8 p.m.			0	0	0	0	Tornado	Small funnel-shaped cloud sighted from Long Island. Strong wind at surface for about 3 minutes.
Marshall County (northeastern portion), Kans.	12	11:30 p.m.					2,500		Electrical	Large barn with 1,500 bales of hay destroyed by fire from lightning.
Harrisburg, Columbia, Gettysburg, and Chambersburg, Pa.	12				1	10			Electrical and rain	A boy killed and 10 other children injured in picnic area near Marietta, when lighting struck near their shelter. Near Gettysburg, 5 valuable cows killed when lightning struck a tree near them. A barn near Chambersburg fired by lightning, with $20,000 loss to it and its contents. Local heavy rains in North Harrisburg flooded cellars and a portion of hospital dispensary.
McPherson, Harvey, Osage, and Coffee Counties, Kans.	13	1:30-4 a.m.		125	0	0	See remarks		Wind and tornado	Strong winds, beginning about 1:30 a.m. in McPherson and Harvey Counties, continued an eastward path, reaching Coffey County about 4 a.m. Oil derricks toppled and pump houses damaged near Inman in a manner to indicate tornadic winds. Trees and power and telephone lines suffered. Incipient tornado near Cottonwood Falls in Chase County about 2:30 a.m. uprooted large trees and unroofed barn.
Sumner County (northwestern portion), Kans.	13	Early a.m.					900		Electrical	Four cows and 2 calves killed by lightning in pasture.
Gillette, Wyo.	13	Afternoon					Light	Light	Hail	
Fort Jackson, S. C.	13	Late afternoon				7			Electrical	Seven soldiers injured, none seriously, by lightning which struck 3 separate areas in fort.
Rudyard, Mont.	13	3-4 p.m.	•5	30				Considerable	Hail	About 50 percent crop damage. Hail up to size of golf balls.
Turner, Mont.	13	3:30 p.m.	•2½	6				Considerable	do	Damage to crops up to 50 percent.
Chinook, Mont.	13		•1½	10-12				5,000	do	Damage to grain and hay.
Floweree, Mont.	13		•3	10-15				150,000	do	
Fort Benton, Mont.	13		•½-3				Slight	75,000	do	Damage mostly to wheat.
Kremlin, Mont.	13	3:30 p.m.	•4	10				50,000	do	Hailstones pea size up to 2 inches in diameter.
Chester, Mont.	13	3:30-6:30 p.m.	880					Severe	do	Two separate storms, one north and one south of Marias River.
Roundup, Mont.	13		•5	15				120,000	do	
Power, Mont.	13	3:30 p.m.	•2	15				Considerable	do	
Dunkirk, Mont.	13	4-6 p.m.						Considerable	do	
Rapelje, Mont.	13	4:30 p.m.	•10	10				Considerable	do	
Devon, Mont.	13	5:30-8:30 p.m.						Considerable	do	

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Broadview, Mont.	13	6 p.m.	*4	20–25			Slight	Severe	Hail	Pigs and chickens killed. Hail up to size of tennis balls.
Geraldine, Mont.	13	7 p.m.	*1½	8				Considerable	do	Damage to grain 25 to 50 percent.
Greenville, S. C.	13–14	8 p.m. to past midnight	*15–20				$500		Electrical and rain	Some damage by spotty washing of soil and overloaded culverts. Lightning did some damage to electric and telephone lines.
Benchland, Mont.	13	8:30 p.m.	*3	6				Severe	Hail	Crop damage from 16 to 100 percent.
Ottawa County (northern portion), Kans.	13	Night					800		Electrical	Four cows killed by lightning.
Norton County, Kans.	14	12:30 a.m.					1,500		do	Lightning struck a wood settling tank in oil field 8 miles southwest of Logan, setting fire to tank and 180 barrels of oil.
Rooks County, Kans.	14	Early a.m.					750		do	Large stack of baled alfalfa near Plainville burned after being struck by lightning.
Nemaha County (northern portion), Kans.	14	5:35 a.m.					2,200		do	Large barn and hay contents burned after lightning strike.
New Orleans, La.	14	Afternoon			1	See remarks			Heat	Woman died; several collapsed from heat.
McCook (near), Nebr.	14	P.m.	*6	10			1,000		Electrical	Five head of cattle killed by lightning.
Boyd County (eastern portion), Nebr.	14	7:30 p.m.					Little	10,000	Hail	
Colfax County (southwestern portion), Nebr.	14	7:55–8:45 p.m.	*2	30			3,000	200,000	do	
Lake Freeman area, Ind.	14	Night	*4	4			150,000	350,000	Hail and wind	Many fields of corn, tomatoes, etc., a total loss from hail. Trees blown over on automobiles, buildings, etc. Hailstones up to 2 inches in diameter actually chewed corn from cob. Windows broken and television antennae toppled. Of the total, all except an estimated $140,000 caused by hail.
South Bend, Ind.	14	Night					50,000		Wind, rain, and electrical	Plate glass windows blown out. Trees blown across power lines. Basements, underpasses, and some first floors flooded. More than 50 percent of television antennae blown down. Most damage by wind. Estimated $4,000 damage by lightning.
Elliott, Iowa	14–15	Late p.m., 14th–early a.m., –15th					3,000		Electrical, rain, and wind	Home struck by lightning.
Fairfield, Iowa	14–15	Late p.m., 14th–early a.m., –15th					4,000		Wind, rain, and hail	Wind blew down tents at Jefferson County Jr. Agriculture Show at Fairfield; rain damaged contents.
Iowa, southern counties	14–15	Late p.m., 14th–early a.m., –15th					See remarks of storm of 29th		do	Spotty hail flattened several corn fields and knocked down numerous power lines.
Muscatine-Clinton area, Iowa	14–15	Late p.m., 14th–early a.m., –15th					See remarks of storm of 29th		Wind, rain, electrical, and hail	Numerous power lines blown down. Occasional corn fields flattened by spotty hail.
Pawnee County (northern and central portions), Nebr.	14	11:30 p.m.	*12–15	12–15			See remarks	See remarks	Wind	Several roofs damaged. Some corn blown down.
Stafford County, Kans.	14	Near midnight					2,800		Electrical	Large barn with attached cattle shed, 700 bales of alfalfa, and 70 bales of straw near St. John burned after lightning strike.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Kansas, extreme northeastern counties	14-15	11:45 p.m. -12:25 a.m.	*8-10	60			$50,000	$400,000	Wind	Severe wind damaged electric and power lines and blew down trees and limbs from eastern Nemaha County to Doniphan County and south to Atchison and Leavenworth Counties. Heaviest damage in Troy-Wathena area of Doniphan County where many trees uprooted, houses and cars damaged by falling trees, barns destroyed, and fruit crops suffered heavy loss.
Elgin (near), N. Dak.	14				0	0	See remarks		Tornado	Small tornado observed west of Elgin. It passed between Mott and Burt. Some damage resulted.
Towanda, Pa.	15	3:30 p.m.							Electrical	A horse killed, another horse and a cow stunned when lightning struck near them; horse valued at $350.
Middlesex and Suffolk Counties, Mass., and southern Rockingham County, N.H.	15	3:40-4:30 p.m.			1		5,000		Electrical and rain	A bus starter killed by lightning in Brookline, Mass. In Wakefield, Mass., power damage worst since hurricane of 1938; power failure closed 20 factories; floods closed Main Street to traffic. Vacant house with valuable antiques in Hampstead, N. H. destroyed.
Hartford, Mich.	15	Afternoon					10,000		Wind	Damaged resort hotel and cottages.
Charlotte, Chester Township, Mich.	15	Afternoon	100	3	0	0	°100,000	°	Tornado	Two barns blown down, others damaged. Funnel-shaped cloud moved northeastward.
Burton, Mich.	15	Afternoon			0	0	°20,000	°	do	Several barns and trees blown down. Utilities interrupted.
Kings Mill, Mich.	15	Afternoon	20	**300	0	0			do	One barn blown down and several damaged.
Gratiot County, Mich.	15	Afternoon					20,000		Electrical	Barn burned to ground after being struck by lightning.
Geneva-Ashtabula-Kingsville-Conneaut area, Ohio	15	Late afternoon and early evening			1		See remarks		Wind, rain, and electrical	Storm left northern Ashtabula County (Lake Erie shore area) in debris from trees, destroying property and causing power failures from Geneva through Conneaut. Damage to power lines in Ashtabula alone expected to mount to several thousands of dollars. Fallen trees demolished several cars and a few homes. Lightning killed one man at Monroe during storm at 3:45 p.m. Storm associated with low pressures in a frontal zone.
Corry and Union City area, Pa.	15	Evening							do	Lightning strikes and falling trees disrupted power and phone lines. Gusty winds estimated at 60 to 70 m.p.h. littered, and in many cases blocked highways with fallen branches and trees. Many awnings damaged. Basements of homes and stores in one section of Corry flooded by sudden rains, backing up storm sewers.
Tucson, Ariz.	15	10:45 p.m., 15th-1:15 a.m., 16th	*10	10			2,000	500	Electrical, hail, and wind	Heavy thunderstorm accompanied by high wind and hail struck Tucson area, causing slight damage to citrus trees; also, lightning damage to power substations and other buildings. Wind up to 50 m.p.h. Damage by hail $250; wind, $675; lightning, $1,575.
Buchannan, Caldwell, Clay, Clinton, Carroll and Ray Counties, Mo.	15	Midnight-1 a.m.					75,000	400,000	Wind	Storm quite severe in city of St. Joseph. Damage to corn reached 10 to 15 percent in good fields, as stalks were broken off or bent partially over. Several roofs of barns blown off or damaged. Trees and telephone lines also suffered.
St. Louis, Mo.	16	4:15-7 a.m.						1,000	Wind and dust	A gale with gusts to 60 m.p.h. resulted in a duststorm which reduced visibility to ½ mile. Falling trees caused breaks in power lines.
Newton County, Mo.	16	7:30 a.m.	*2	7			0	1,200	Hail	Heavy damage to the few fields of corn in area near Granby. Largest stones 1 inch in diameter.
Gloversville, N. Y.	16	1:40-2:40 p.m.					2,000		Electrical and rain	Many electric and telephone services disrupted by lightning. Streets and cellars flooded.
Amsterdam, N. Y.	16	2-5 p.m.					5,000		Hail and rain	Heavy rain flooded some cellars, halted traffic, and affected 300 telephones. Every pane of glass in a greenhouse broken by hail; loss $5,000.
Ashton (near), Nebr.	16	Afternoon	*5	10			Little	30,000	Hail	

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Allentown area, Pa.	16	5-6 p.m.				1			Wind and rain	Winds, accompanying a thunderstorm, ripped off 2 chimneys and a section of 2 roofs. Some power lines broken by falling branches. A truck skidded on wet highway, hit an abutment and injured the driver. Numerous television antennae toppled and power failure put one radio station off the air for 2 hours.
Southern Hampden and northern Plymouth Counties, Mass.	16	6-8 p.m.			1		$36,000	$15,000	Electrical	Child killed by lightning in Palmer, Mass. Considerable damage to tobacco in Connecticut Valley. Church damaged in West Bridgewater.
Lancaster, S. C.	16	6:30 p.m.					8,000		do	Fire from lightning destroyed residential dwelling.
Otsego County, N. Y.	16	P.m.					See remarks	500,000	Hail, wind, and rain	Wind, heavy rain, and hail caused crop losses. Hailstones ranged up to baseball size. About 2,500 window panes broken in Gilbertsville alone.
Schenectady, N. Y.	16	P.m.					25,000		Rain	Heavy rain caused washouts and flooding of cellars and streets.
Phillipsburg, N. J.	16	P.m.					1,000	3,000	Hail and rain	Hail about 1/4 inch in diameter fell in Phillipsburg area.
Rahway, N.J.	16	P.m					500		Electrical	Two homes struck by lightning on outskirts of Rahway.
Morton and Dunn Counties, N. Dak.	16	Evening					See remarks		Hail	A severe hailstorm in and around Mandan caused damage up to 100 percent. Another storm near Dunn Center started 2 miles southwest and was 2 to 6 miles wide, causing considerable damage.
Howard County (western half), Nebr.	16	8-8:30 p.m.	*2	10			10,000	36,000	Hail and wind	
New Orleans, La.	16	8-9 p.m.			3	3	250,000	Slight	Thundersquall	Moved southwestward. Winds reached 80 m.p.h. at New Orleans Airport, 70 m.p.h. in Metairie, and 63 m.p.h. at Moisant Airport. Developed over Lake Pontchartrain. Amusement equipment at beach severely damaged. Boats at yacht harbor damaged. Shingles blown from roofs; trees downed across wires; fires started; airplanes blown loose from moorings and damaged; skiffs sunk; awnings torn loose; garages shifted on foundations; billboards ripped down; lifeguards patrol boat blown 500 feet across sand and concrete roadway; revival tent ballooned by wind, injuring 3 persons; electric and telephone services disrupted, with some major repairs in telephone services necessary.
Pleasant Hill (near Lancaster), S. C.	16	Night			1				Electrical	Man killed by lightning.
Schleswig-Ricketts area, Crawford County, Iowa	16	Late evening	*1				See remarks		Wind, hail, and rain	Corn fields stripped and numerous vegetable gardens ruined. Storm extended length of county from northwest through southeastern portion.
Colorado Springs, Colo.	17	2 p.m.			1	1			Electrical	One man killed and 1 seriously injured by lightning while working on building roof.
Belfield, N. Dak.	17	5:30 p.m.					See remarks		Hail	Considerable damage reported north of town.
Valley County (eastern third), Nebr.	17	7-7:20 p.m.	*12					180,000	do	
Jamaica, British West Indies	17-18	8 p.m.-1 a.m.			152	2,000	50,000,000	6,000,000	Hurricane	Information from governmental and private agencies and the press shows practically no damage to islands east of 75th Meridian in eastern Caribbean in connection with this hurricane. Storm's irregular path and degenerating characteristics during first 2 days were in marked contrast to its intense fury and destructive force as the disturbance passed south of the Island of Jamaica on night of the 17th. For five hours Jamaica was battered by this hurricane. About 25,000 persons homeless. More than 20,000 buildings destroyed or severely damaged. Drinking water supply polluted, and sewerage and sanitation facilities disrupted. Many farms ruined; truck crops destroyed, banana plantations torn up, and cocoanut groves will

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										take 4 years to recover from destructive winds.
Montgomery County (northwestern portion), Kans.	17	Night					$2,200		Electrical	Large barn, 3 calves, and quantity of hay burned as result of lightning strike.
Berrien Springs, Mich,	17	11:15 p.m.						See remarks	Hail	Severe hail destroyed fruit crop in area of several miles.
Wolverine, Mich.	18	6:30 p.m.	600			2	10,000	$5,000	Hail and wind	Hail up to 2 inches in diameter accounted for $9,000 damage and wind for $6,000 damage.
Tucson, Ariz.	18	9:30 p.m.	200	**300			°1,500	°	do	Localized high wind accompanied thunderstorm with light hail. Roofs torn off 10 homes in area, with some damage to other roofs. A few trees blown down, as well as a few power lines.
Hickory, Va.	18	Night					22,000		Electrical	House struck by lightning and burned.
Washington County (southern portion), Kans.	19	7 a.m.					2,300		do	Barn with 1,200 bales of hay and 60 bushels of oats burned after being struck by lightning.
Timonium, Md.	19	2:30 p.m.			1	1			do	Boy killed and man stunned by lightning while golfing.
Dover, Hillsborough County, Fla.	19	Afternoon			1				do	Girl killed by lightning while in yard of home.
Marshall County (northern portion), Kans.	19	Night					2,200		do	Barn with considerable baled hay destroyed by lightning set fire.
Lancaster County, Pa.	19–20	Overnight				1			Electrical, rain, hail, and wind	Lightning struck and fired a barn with loss of $30,000. Power and phone lines out for periods up to 8 hours, due to lightning, rain, and wind damage. Factory unroofed and several homes damaged by wind, with many windows broken. First storm hit between midnight and 1 a.m., and the second came about 2 a.m. Pequea Creek in Paradise rose 5 feet in 15 minutes, flooding streets and homes and stranding cars. Several roads blocked by flash flood waters. Ground floors of 2 Lancaster hospitals flooded. Hail damaged many acres of tobacco and other crops in Elizabethtown–Mt. Joy–Marietta sector. Newspaper reports indicate thunderstorm most severe in 10 years.
Harrisburg area, Pa.	19–20	Overnight							Electrical and rain	Heavy rains overtaxed sewers, resulting in flooded streets and basements in many parts of city. Lightning burned off two 4,000-volt feeder lines, idling pumps which permitted a major underpass to be flooded.
Poplar, Mont.	19	Evening						Considerable	Hail	
Enid-Lambert area, Mont.	19							50,000	do	
Susanville, Larsen County, Calif.	19–22								Wind, rain, and hail	Frequent thunderstorms and strong winds. Observers reported that upper atmosphere showed little sign of wind as clouds were nearly stationary. There was a general movement from southeast. Low stratus movement changed direction frequently. On 22d a violent thunderstorm hit Fox Mountain area, depositing over 2 inches of hail and copious rain.
Brown County, Kans.	20	7 a.m.					2,500		Electrical	Large barn and large tonnage of alfalfa, clover, and brome hay and seed wheat burned west of Hiawatha.
Lewes, Del.	20	9 a.m.					See remarks	See remarks	Wind and hail	Thunderstorm with hail ½ inch in diameter broke trees and limbs and blew down crops. Power shut off over 2 hours.
Greater Boston, Essex County, Mass.	20	12–4 p.m.				1	3,000	1,000	Electrical, hail, and rain	Drenching rains. Some crop damage from hail. Scores of homes and 3 churches struck.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Salisbury, Md.	20	1 p.m.					See remarks	See remarks	Electrical and winds	One-inch rainstorm with hail damaged fields of corn, sweet potatoes, and tomatoes 20 trees toppled, 2 of them on top of automobiles. Wind speed up to 40 m.p.h. Furniture warehouse set ablaze, possibly due to lightning. Power and telephone lines disrupted.
Tolland County, Conn.	20	3-6 p.m.			0	0	See remarks		Tornado	Described as "local tornado occurring during a thunderstorm" by the observer at Storrs Agriculture Experimental Station. At Willington, 4½ miles to the north, a barn lifted from its foundation and hurled onto 2 parked cars.
Springfield-Pritchett area, Colo.	20	3-5 p.m.	*10	12			$2,000	$53,000	Hail and wind	Hail, ranging in size from peas to golf balls and accompanied by moderate to strong winds, caused severe crop losses and some damage to buildings.
Providence, R. I.	20	8-12 p.m.				1	11,000		Electrical	Several barns burned in Providence-Woonsocket area; cottage destroyed at Tiogue; other fires started, but extinguished.
Valley County (southwestern quarter), Nebr.	21	1-2:30 a.m.	*15-20	20			12,000	Little	Wind and hail	
Southern Rockingham County, N. H.	21	3-3:10 p.m.	30-40	5	0	0	4,000	See remarks	Tornado	In Atkinson, a large dairy barn partially unroofed. Cornfields levelled in a swath 3 miles long.
Essex County, Mass.	21	3-3:15 p.m.	100	12	0	0	2,500		do	Called a "twister" as it passed through North Andover, Boxford, and Byfield. It demolished a large barn; also several garages, one being carried away without trace of debris. Many trees uprooted; observer said whirling winds were carrying up young juniper trees and "just about everything".
Litchfield and Middlesex Counties, Conn.	21	5:15-5:30 p.m.	100	**900	0	9	125,000	10,000	do	Havoc wrought by violent winds at Kent, New Milford, Washington, Watertown, Bridgewater, Bethlehem, Litchfield, Thomaston, and Bristol - all small towns except the last. Man in Watertown severely injured under collapsed barn. Paths variously described as 20 to 100 yards wide and ½ to 1 mile long. At East Hampton, unroofing of fishnet factory ($100,000 loss) injured 8 occupants.
Clarksdale, Miss.	21	Late afternoon					10,000	Slight	Thundersquall	Trees uprooted; windows smashed; lines downed; grain elevator hit and damaged; scaffolding blown down.
Elkton, Md., northeastward into Delaware	21	7 p.m.	*3-6		2		°50,000	°	Electrical, wind, and hail	Woman killed as lightning-struck tree fell on top of farmhouse. One boy electrocuted by falling power line, while riding bicycle. Television antennae bent, and torn loose. Roofs of homes and business concerns damaged. Greenhouses, windows, and store display windows damaged. Two automobiles and a half-ton truck blown off road, overturning truck. Elkton without power for 30 minutes. Trees knocked down across streets. Hailstones measuring from ½ to 5½ inches in diameter damaged tomato and corn crops.
Marcus Hook area, Pa.	21	Evening							Wind	Thunderstorm with strong south-southwest gusts caused considerable damage to trees and television antennae.
Fort Myers, Fla.	21				1				Electrical	Farm hand killed by lightning while driving tractor.
Wood River, Ill.	21						100,000		do	A lightning-set fire destroyed a large gasoline storage tank.
San Francisco, Calif.	21								Electrical and hail	Thunderstorm accompanied by cloud to cloud and cloud to ground lightning. Hail in various parts of city. Electric power and light services disrupted in various parts of San Francisco. Transportation on Municipal Railway System delayed in half a dozen sections.
Chino Valley (near), Ariz.	22	10 a.m.			0	0	0	0	Tornado	Funnel cloud observed forming and touching ground momentarily and finally dissipating. Entire path over rangeland. Formed 4 miles west-southwest of Chino Valley station and moved eastward. Entire life cycle of tornado about 30 minutes.
Calcasieu Parish, La.	22	Afternoon			0	0	5,000	0	do	One home destroyed 13 miles from De Quincy.
Dillon, Mont.	22	4-5 p.m.	880	2				5,000	Hail	
Myrtle Beach, S. C.	22	Early night					500		Electrical	Some damage to wires and cables, causing interruption to electric and communication services.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Character of storm	Remarks
Bamberg, S.C.	22	Night				5			Electrical	Five men injured, none seriously, by lightning.
Theodore, Ala.	22				1		See remarks		do	Farmer killed by lightning in Dawes community about 18 miles west of Theodore, when he and eight other men had taken shelter during an electrical storm in a house that was under construction. None of the other men were injured. The house suffered extensive damage.
Big Timber, Mont.	23	3 p.m.	•8	16			$4,000	$40,000	Hail	Hailstones size of walnuts.
Bozeman, Mont.	23	3:30 p.m.	•2–2½	8–9			500	200,000	do	Hailstones 1½ inch in diameter. Damage to wheat, peas, alfalfa, and barley. Reported to be worst hailstorm in 20 years.
Clydepark, Mont.	23	4 p.m.	880	10				Severe	do	
Ballantine, Mont.	23	4:40 p.m.	•5	17			Slight	Considerable	do	Heavy damage to sugar beets. Strong almost tornado-like wind accompanied storm.
Pompeys Pillar, Mont.	23	5 p.m.	•4	25			Slight	Considerable	do	Damage to crops up to 100 percent.
Custer, Mont.	23	5:30 p.m.	•6	12			Slight	Severe	do	Crops damaged up to 100 percent. Strong tornado-like wind accompanied storm.
Myers, Mont.	23	6 p.m.	•3	13				Severe	do	Hailstones up to size of pullet eggs.
Big Horn, Mont.	23	6 p.m.					Slight	Considerable	do	About 25 percent damage to crops.
Forsyth, Mont.	23		•5–8	20			Slight	75,000	do	
Russell County, Kans.	23	8 p.m.					9,000		Electrical	Six hundred barrels of oil, 2 storage tanks, and gun barrel destroyed north of Russell.
Rush County, Kans.	23	Night			0	0	100		Tornado and rain	Chicken coop removed by small tornado during torrential rains in McCracken vicinity.
Jefferson County, Kans.	24	4:30 a.m.					2,000		Electrical	Large hay barn with 20 to 25 tons of hay and 22 hogs lost after lightning caused fire, 6 miles southwest of Oskaloosa.
Franklin County (northeastern portion), Kans.	24	7:30 a.m.			0	0	750		Tornado	Tornado from southeast struck farm. It blew garage away leaving car, smashed chicken house, and moved large barn from foundation.
Kalispell, Mont.	24	11:30 a.m.						Little	Hail	A number of storms throughout area during day. Worst one at 11:30 a.m. caused shattering of wheat.
Cut Bank, Mont.	24	2:30 p.m.	1,760	4				8,000	do	
Lodge Grass, Mont.	24	2:45 p.m.	•4	15			Slight	Severe	do	Crop damage up to 100 percent. Damage mostly south and east of Lodge Grass. Unmelted hail in 6 to 10-inch piles following morning.
Busby-Lame Deer area, Mont.	24	Afternoon					Slight	Severe	do	Damage to roofs; windows broken. Severe damage to alfalfa seed crop.
Birney, Mont.	24	Afternoon						Severe	do	Severe damage to alfalfa seed crop.
Big Sandy (Lonesome Lake), Mont.	24		•3					Considerable	do	Hail up to size of quarters. 50 to 85 percent damage.
Delta-Austin area, Colo.	24	4–5 p.m.	•12	15			500	8,000	Wind	High winds, reaching estimated speed of 50 m.p.h., damaged transmission lines, trees, and small buildings, and caused considerable loss of fruits.
Coalwood-Epsie-Olive area, Mont.	24	5–6 p.m.	•15	35–40			Severe	Severe	Hail	Hail up to size of hens' eggs. Roofs damaged and windows broken. Alfalfa seed crop severely damaged. Also, considerable damage to wheat. Reported to be worst hailstorm in 40 years.
Rawlins County (eastern portion), Kans.	24	5:30 p.m.	100	4	0	0	20,000	30,000	Tornado and hail	Tornado, moving east-northeastward, demolished buildings on 7 farms with minor damage to 1 home. Hail destroyed crops in its path. Property damaged by tornado; crops by hail.
Coltman (near Idaho Falls), Idaho	24	5:30–6:30 p.m.	•1½	2½				See remarks	Hail and wind	Hailstones ½ to 3/4 inch in diameter accompanied by high wind did severe damage to alfalfa, grain, and potatoes. About 3 inches of hail on ground after storm. No damage to livestock or buildings.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
New Brighton and vicinity, Minn.	25	A.m and p.m.					$200,000		Electrical	A bulk oil plant at New Brighton destroyed by fire after being struck by lightning. Also, four places in Minneapolis struck by lightning, with only minor damage. Some trees blown down.
Kansas, central and eastern counties	25	4:30–10:30 p.m.		250	0	0	24,000		Wind (tornadic)	Strong winds developed over much of area from south-central Kansas northeastward. Severe wind with tornadic characteristics developed in several localities including near Kiowa in Barber County where barn, cattle shed, and machine shed roof were destroyed; in Wabaunsee County with at least 3 centers of damaging wind; in northeastern Ottawa County, and in northern Reno County where barn and roof of house damaged and trees uprooted. A number of localities reported damage in general storm area.
Ridgefield, N. J.	25	7 p.m.			5	5	2,000		Thunderstorm	Deaths and injuries all in metropolitan area.
Tampa, Fla.	25				1				Electrical	Fisherman killed by lightning while casting from 14-foot boat in Tampa Bay.
Oakes (near), N. Dak.	25						See remarks		do	Lightning struck a barn 6 miles from Oakes killing 2 valuable cows.
Titusville, Fla.	26	2–7 a.m.							Rain	Rain of 6.04 inches fell during this period.
Lyons County, Kans.	26	Early a.m.					3,000		Electrical	Two Emporia churches struck during same storm. Heavy tile-roofed dome of one destroyed as well as most of electrical wiring. At other church chimes and public address system put out of commission.
Marmarth, N. Dak.	26	9:30 p.m.					See remarks	See remarks	Hail and wind	Severe hail ruined gardens, broke windows, and damaged fields up to 85 percent. Stones size of marbles. High winds from southwest accompanied storm.
Remsen (north of), Iowa	26	Midnight	140	6	0		See remarks		Tornado	Tornado accompanied by rain, high wind, and lightning moved over 5 farms, destroying 9 buildings, killing some livestock, and damaging farm implements and crops. Path of tornado northeastward then eastward. Estimated $11,000 damage to farm that was hit hardest.
Pisinemo, Ariz.	27	Afternoon					°600	°	Rain	Heavy rains accompanying thundershower washed out some roads and damaged a few adobe houses.
Northwestern Olympic Peninsula and San Juan Islands, Wash.	27	4–6 p.m.					See remarks	See remarks	Rain and wind	Strong winds and rain, accompanying a coastal storm, did moderate damage in extreme western Clallam and Jefferson Counties. At Forks, Spruce, and vicinities in those counties some trees uprooted, also at Olga on Orcas Island of San Juan Island group. Slight damage to small craft along north shores of Orcas Island by moderate northeast gale from same general disturbance. No damage to crops reported.
Louisville, Ky.	27	P.m.					3,000		do	Storm hit northeastern section of city only. Greatest damage to planes at Bowman Field.
Bigheart, Osage County, Okla.	27				1	1			Electrical	Lightning struck tree under which man and wife sought shelter. Man killed, wife knocked to ground and injured.
Fergus Falls (vicinity of), Minn.	28	5 a.m.					2,000		Wind and rain	A barn wrecked 3 miles south of the city. Heavy rains accompanied thunderstorm.
Mora (vicinity of), Minn.	28	7:30 p.m.					5,000		Electrical	Three buildings destroyed by fire after being struck by lightning. Several head of livestock killed. Two persons suffered shock when struck by lightning.
Butternut (near), Wisc.	28	P.m.					1,500		do	Lightning killed 5 head of cattle.
Terry, Mont.	29	1:30 a.m.	•25	40				$10,000	Hail	10 to 90 percent damage to sugar beets and grains.
Rock Island, Henry, and Whiteside Counties, Ill.	29	Early morning					10,000	240,000	Electrical and rain	Thunderstorms and heavy rain resulted in serious damage to lowland fields. Property damage resulted from a barn destroyed by lightning-set fire and from basement cave-ins.
Davenport, Iowa	29	Early morning					See remarks		Rain	Davenport reported a rainfall of 2.05 inches in slightly over an hour. Just eastward at Moline, Ill., 4.60 inches fell. Damage to storm sewers and basements of houses and businesses. Davenport Weather Bureau reported that aggregated loss due to storms for August exceeds $250,000. This brought about by wind on 15th, lightning and rainfall on 14th, 15th, and 29th, and lightning on 20th.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Columbus, Mont.	29	Afternoon						Considerable	Hail	
Delta, Colo.	29	5:15 p.m.					$750		Electrical	Lightning struck house, damaging all electrical equipment.
Imperial County, Calif.	29						30,000		Rain	Drenching rains left many washed out roads in Imperial County. Rains also badly damaged Imperial Irrigation District's canal system. All dirt roads in Imperial Valley reported closed. More than ½ mile of levees in Westmorland district washed out. Two holes made in a canal bank in another district.
St. Joseph and vicinity, Minn.	30	10:30 a.m.				4	10,000	See remarks	Wind and rain	A large shed demolished; night club damaged extensively; a number of trees uprooted; homes, barns, silos, garage, buildings, loading docks, and gas pumps damaged; signs and billboards downed; growing crops damaged. Heavy rains accompanied the thunderstorm.
Wisconsin, northeastern portion	30	P.m.					25,000	$5,000	Winds	Some property damage in northern Outagamie and Marinetta Counties. High winds damaged some farm buildings, disrupted telephone and power lines, and flattened some corn in fields.
Lansing, Mich.	31	2 a.m.				1	50,000		Electrical	Barns hit by lightning and burned at Muir, Laingsburg, and near Howell.
Escanaba, Mich.	31	3:30 a.m.					10,000		do	Vacation camp burned.
Saginaw Bay, Mich.	31						30,000		Wind	Cottages and boats damaged or destroyed.
Boulder area, Colo.	31	1-1:30 p.m.	*2	4			20,000	4,000	Hail	Hailstones varied from size of peas to walnuts; 1 to 2 inches accumulated on ground with drifts 6 to 8 inches deep. Damage mostly to roofs, greenhouses, and automobiles. Some damage to gardens and trees.
Denver area, Colo.	31	1:30-2:30 p.m.	*4	12			150,000	10,000	do	Storm most severe over north portion of metropolitan Denver. Stones varied in size up to 2 inches in diameter. Transportation halted. Hail and water accumulated to several feet in lower sections. Greatest damage to airplanes, automobiles, roofs, and greenhouses. Some damage to gardens and shrubbery.
Russell, Ellsworth, Rice, Saline, McPherson and Dickinson Counties, Kans.	31	2:40-6 p.m.		200	0	0	120,000		Wind, hail, and tornadoes	Series of storms along squall line beginning with heavy hail in Russell and parts of Ellsworth and Rice Counties. Heavy wind in many localities with evidence of 4 tornadoes—2 aloft southeast of Russell, 1 in southern Saline County which destroyed a barn and shed, and 1 near Herington which caused $20,000 damage to buildings on one farm. Hail damage to cars, windows, and other property in Russell County alone estimated at $75,000. Damage by hail, $85,000; tornadoes, $25,000; wind, $10,000.
Alva (4 miles south of), Woods County, Okla.	31	3:50 p.m.	440	½	0	0	2,000	0	Tornado	Damage to farmstead. Path southeastward. Accompanied by light hail 1/4 inch in diameter.
Brusett, Mont.	31	4 p.m.	*3	25			Slight	25,000	Hail	Damage to wheat, flax, and corn.
New Orleans, La.	31	4-5 p.m.					10,000		Thundersquall	Moved from east. Winds broke windows and tree limbs, and blew shingles from roofs.
Alexandria, La.	31	Evening				2	20,000		do	Struck in city; 2 persons injured in auto; trees uprooted; plate glass windows shattered; power lines severed; shingles blown off roofs.
Holmes, Stark, and Wayne Counties, Ohio	31	Evening					See remarks	See remarks	Rain, hail, and wind	Reports available indicate several barns burned in the Counties. Heavy damage in Stark County to corn in small areas where heavy hail.
Eastern Pottawatomie, Jackson, Jefferson, and Leavenworth Counties, Kans.	31	7-9 p.m.		150			23,000	1,000	Wind (tornadic) and electrical	Storms in this area were result of same squall line that produced storms listed in central counties on same date. Damage to trees, barns, and power lines in Holton area, Jackson County indicate possibility of tornado. Power lines and trees suffered in Jefferson and Leavenworth Counties. A dairy barn and contents near Leavenworth destroyed by lightning. Property damage, $12,000 by wind and $11,000 by lightning.
Platte County, Mo.	31	9-11 p.m.	*20	35			7,000	Slight	Wind and hail	Hail as large as walnuts accompanied high wind which caused power line breaks, broke windows, felled trees, and damaged barns over fully ½ of total area of

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										County. Storm path extended from Platte City to Edgerton, affecting also Camden Point, DeKalb, Dearborn, and Ferrelview.
Brown County, Kans.	31	Night					$1,200		Electrical	Six head of cattle killed by lightning near Robinson.

LATE STORM REPORTS FOR JULY 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Killed	Injured	Property (exclusive of crops)	Crops	Character of storm	Remarks
Maple Glen, Pa.	19	11:45–11:48 a.m.			0	0			Tornado	Tornado swept through Maple Glen area, uprooted trees and flattened corn.
Elfrida, Ariz.	27	3 p.m.	*3	8				$25,000	Hail	Heavy hail with stones up to marble size damaged cotton, maize, alfalfa, etc. Storm moved southwestward from about 6 miles north of Elfrida to about 2 miles southwest of town.

* Miles instead of yards.

** Yards instead of miles.

° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

AUGUST 1951

The flooding during August was insignificant in comparison with the flooding of the previous month. Floods again visited the Kansas-Missouri area which was so severely hit by the floods in July. This time, however, the floods were mostly light except in the McCracken and Brownell, Kans. areas along Big Timber Creek, where the crest was the highest remembered by long-time residents. There were two rises along the main stem of the Missouri River with light overflow at and below Nebraska City, Nebr.

The drought in the Southwest continued but was somewhat relieved in central Arizona where heavy rains occurred in connection with the hurricane which moved inland over Tampico, Mexico.

UPPER MISSISSIPPI BASIN.—Minor flooding occurred on the lower Kickapoo River on the 6th and in the upper Iowa River drainage between New Albin and Harpers Ferry, Iowa on the 8th due to frequent heavy rains. Only minor property damage resulted from the flooding in the lower Kickapoo. Some damage resulted to highways and railroads in the upper Iowa River Basin.

Heavy rainfall (2.5 inches) on the 5th and 6th caused light flooding along the Pecatonica River at Darlington, Wis., and Freeport, Ill. This heavy rain occurred in a period of 18 hours or less on soil that was still quite moist from a prolonged period of frequent showers. The runoff, therefore, was quite high and very rapid. It caused a sudden rise in the Pecatonica River in the Mineral Point area, flooding a lumber company and sweeping away two railroad cars loaded with coal. At Darlington, Wis., about one and one-half blocks of the business section were flooded. This was the second flash flood in that community in a month.

MISSOURI BASIN.—Heavy general rains averaging 2 inches fell over the North Branch of the Elkhorn Basin during the night of the 19th, producing local flooding near Pierce, Nebr., from the 20th to the 22d. Approximately 900 acres of farm and pasture land near the North Branch were flooded in the area from the city limits of Pierce, Nebr., southeastward to near Hadar, Nebr. Flooding was confined to lands immediately adjacent to the stream.

Heavy showers and thundershowers from the 12th to the 18th caused flooding along the Floyd River from Merrill, Iowa, down to James, Iowa, from the 14th to the 18th. Rainfall during this period ranged from 4 to 7 inches over the lower half of the valley and from 1 to 4 inches over the upper half. Additional flooding occurred again on the 28th and 29th in the vicinity of James, Iowa.

Light overflows occurred on the Big Blue River near the Kansas-Nebraska border on the 15th and 16th and on the Solomon River at Beloit, Kans., between the 14th and 17th. Some minor flooding occurred on the Smoky Hill River at Lindsborg, Kans., on the 7th and on the Little Blue River at Endicott, Nebr., on the 14th. Minor flooding also occurred on the upper Republican River between the 10th and 16th due to locally heavy showers in southwestern Nebraska. Flooding on the Blue and Solomon Rivers was due to rainfall totalling 1 3/4 to 2 inches between the 13th and 15th.

On the 23d-24th torrential rains ranging from 3 to 7 inches fell in Rush County in the McCracken and Brownell, Kans. areas causing Big Timber Creek to rise briefly to a higher crest than many long-time residents could remember. No one was injured. Some damage resulted to farm lands, roads, bridges and crops along the stream.

Heavy rains during the period from the 9th to the 15th caused the Missouri River to rise to above bank-full stage from Nebraska City, Nebr., to Waverly, Mo. The rainfall during the period averaged 3.4 inches as far downstream as Jefferson City, Mo. Backwater from the Missouri River caused the Grand River to rise to about 2.5 feet above bank-full level at Brunswick, Mo. Another rise occurred along the Missouri River following the heavy rains (3.4 inches) from the 24th to the 28th. Light flooding resulted in the reach from Waverly to St. Charles, Mo.

ARKANSAS BASIN.—Minor flooding occurred along the Neosho River during the latter part of August due to heavy rain between the 26th and 28th averaging 3.3 inches. No damage was reported.

WEST GULF OF MEXICO DRAINAGE.—Heavy local showers in the Albuquerque, N. Mex., area and in the nearby Sandia Mountains during the night of July 31-August 1 caused high flow from arroyos, flooding portions of Albuquerque during the early morning hours of August 1. Rainfall in Albuquerque totalled 0.67 inch at the Airport and 1.2 inches at the Climatological substation. A considerable area in the lowlands in North Albuquerque was flooded with most of the damage resulting to buildings.

The heavy showers of the 31st-1st covered a considerable area in the Sandia Mountains where stations reported amounts ranging from 1.15 to 1.5 inches. The Rio Grande at Albuquerque reached flood stage during the morning hours of the 1st with a crest stage of 6.42 feet on the U. S. Geological Survey recorder at 10 a.m. on the 1st.

On August 4 heavy showers (2.1 inches) in the Espanola, N. Mex., area and in the nearby mountains caused considerable flooding in the city of Espanola. Most of the damage was to residential property.

COLORADO BASIN.—Heavy rainfall from the 26th to the 30th caused flooding on the Hassayampa River at Wickenburg, Ariz., on the Agua Fria River at Marinette, Ariz., and on the Gila River at Kelvin, Ariz., during the latter part of the month. The rainfall over the Hassayampa and Agua Fria River Basins averaged 6.44 inches during the 5-day storm. The heaviest rainfall during the period was 13.56 inches at Crown King, Ariz., followed by 11.87 inches at Castle Hot Springs.

The principal damage occurred along the bottom lands on the north side of the Gila River for a distance of about 30 miles (Tolleson to Arlington). Several bridges were washed out by flash floods coursing down normally dry washes along the Southern Pacific track between Wellton and Phoenix. A work train was derailed when crossing a weakened trestle near Arlington on the 28th.

COLUMBIA BASIN.—A flash flood occurred on the Portneuf River near the village of Inkom, Idaho, on the 21st due to heavy thundershowers. Two small bridges on Rapid Creek were washed out as water rushed down the mountain slopes. No damage occurred to any towns below Inkom. Several hundred acres of bottom land were flooded causing damage to potatoes and beets, but principally to wheat.

FLOOD STAGE DATA

(All dates in August unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages –dates		Crest*	
		From–	To–	Stage	Date
MISSISSIPPI SYSTEM Upper Mississippi Basin	Ft			Ft	
Upper Iowa: Dorchester, Iowa	17	6	6	17.3	6
Kickapoo: Steuben, Wis.	8	6	6	8.2	6
Pecatonica:					
Darlington, Wis.	—	6	7	16.5	6
Freeport, Ill.	12	11	12	12.2	11
Skunk: Augusta, Iowa	15	27	29	16.0	28
Missouri Basin					
Floyd:					
Merrill, Iowa	12	14	17	13.7	15
James, Iowa	16	13 28	18 29	19.4 16.5	15 29
North Fork: Pierce, Nebr.	12	20	22	13.2	21
Solomon: Beloit, Kans.	20	14	17	24.5	16
Smoky Hill: Lindsborg, Kans.	21	7	7	21.3	7
North Fork: Benkelman, Nebr.	5	10	10	5.9	10
Republican:					
Cambridge, Nebr.	6	11 14	11 14	6.3 6.6	11 14
Stamford, Nebr.	14	16	16	14.2	16
Little Blue: Endicott, Nebr.	9	14	14	9.2	14
Big Blue:					
Barnston, Nebr.	18	15	16	22.0	15
Blue Rapids, Kans.	20	15	16	22.5	15
Grand: Brunswick, Mo.	12	17 26	20 31	14.6 14.7	18 29
Blackwater: Blue Lick, Mo.	25	28	Sept. 2	31.1	30
Lamine: Clifton City, Mo.	15	28	29	21.5	29
Marais des Cygnes: La Cygne, Kans.	25	28	29	25.5	29
Osage: Lakeside, Mo.	60	30	**	——	—
Missouri:					
Nebraska City, Nebr.	15	16	16	15.6	16
Lexington, Mo.	22	16 27	18 27	23.0 22.3	17 27
Waverly, Mo.	18	16 25	20 31	19.8 19.3	17–18 28
Boonville, Mo.	21	28	30	21.7	29
Hermann, Mo.	21	30	31	23.2	30
St. Charles, Mo.	25	29	Sept. 1	26.4	31
Arkansas Basin					
Neosho:					
Iola, Kans.	15	27	28	15.2	28
Chanute, Kans.	20	27	29	22.2	28
Oswego, Kans.	17	29	30	18.2	29
WEST GULF OF MEXICO DRAINAGE					
Rio Grande: Albuquerque, N. Mex.	4	1	1	6.4	1
GULF OF CALIFORNIA DRAINAGE Colorado Basin					
Agua Fria: Marinette, Ariz.	8	28	29	8.7 8.6	28 29
Hassayampa: Wickenburg, Ariz.	5	26 27	26 27	5.0 6.0	26 27
Gila: Kelvin, Ariz.	5	27	28	6.8	27

* Provisional.

** Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

AUGUST 1951

Standard pressure surface (mb.)	ALBANY, N. Y. (1005 MB.)				ALBUQUERQUE, N. MEX. (840 MB.)				ATLANTA, GA. (981 MB.)				BIG SPRING, TEX. (925 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (911 MB.)				BROWNSVILLE, TEX. (1013 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	86	17.9	66	31	1,620	24.4	46	31	307	25.7	71	31	784	28.8	42	31	505	18.7	78	31	868	24.6	35	31	6	27.3	84
1,000	31	131			31	55			31	139			31	80			31	105			31	43			31	119	26.8	81
950	31	575	18.7	70	31	522			31	595	25.9	64	31	540			31	551			31	506			31	580	24.6	73
900	31	1,035	15.8	69	31	1,007			31	1,069	23.4	64	31	1,029	29.5	39	31	1,016	17.9		31	978	25.8	26	31	1,047	22.6	62
850	31	1,518	12.5	71	31	1,514			30	1,566	19.8	67	31	1,537	25.9	42	31	1,503	14.9	64	31	1,478	22.9	23	31	1,543	20.3	54
800	31	2,025	9.6	69	31	2,046	22.3	41	31	2,086	16.2	67	31	2,067	21.3	49	31	2,014	11.9	65	31	2,001	18.6	26	31	2,065	17.7	49
750	31	2,565	6.7	62	31	2,607	18.4	44	31	2,635	12.8	65	31	2,622	16.5	58	31	2,559	8.9	58	31	2,555	14.1	31	31	2,619	14.7	45
700	31	3,122	3.6	59	31	3,191	13.9	47	31	3,209	9.5	57	31	3,205	11.8	61	31	3,119	5.4	51	31	3,126	9.3	35	31	3,194	11.3	42
650	31	3,723	0.5	55	31	3,816	8.9	54	30	3,826	6.4	47	31	3,826	8.0	50	31	3,725	1.7	50	31	3,736	4.3	39	31	3,816	7.6	41
600	31	4,360	- 2.9	43	31	4,469	3.7	62	31	4,473	2.8	44	31	4,478	4.1	41	31	4,362	- 2.4	44	31	4,381	- 0.7	43	31	4,465	3.6	41
550	31	5,043	- 6.8	32	31	5,176	- 1.4	68	29	5,177	- 1.1	45	31	5,185	- 0.3	43	31	5,051	- 6.9	39	31	5,071	- 5.9	47	31	5,172	- 0.5	39
500	31	5,781	-11.3		31	5,924	- 6.4	66	30	5,926	- 5.3	44	31	5,938	- 4.7	38	30	5,784	-11.5	33	31	5,810	-11.1	48	31	5,923	- 4.9	35
450	30	6,586	-16.7		29	6,753	-10.8	54	29	6,756	-10.3	38	31	6,765	- 9.8	33	30	6,590	-17.0	34	31	6,617	-16.5	42	31	6,754	-10.0	35
400	30	7,455	-22.5		30	7,639	-16.3	43	29	7,643	-16.0	34	30	7,660	-15.8	31	30	7,455	-23.6	36	31	7,487	-22.8	40	31	7,643	-16.3	32
350	30	8,421	-29.4		29	8,629	-23.4		29	8,634	-22.9	30	30	8,653	-22.9		30	8,417	-30.9		30	8,454	-29.9	36	30	8,631	-23.5	32
300	30	9,503	-37.5		29	9,736	-31.9		27	9,745	-31.1		29	9,762	-31.2		30	9,491	-39.1		30	9,535	-37.6		30	9,739	-31.9	
250	29	10,744	-45.2		29	10,997	-41.9		26	11,011	-41.2		28	11,025	-41.4		30	10,716	-48.0		30	10,769	-46.2		30	11,001	-41.7	
200	28	12,213	-51.3		29	12,474	-52.7		24	12,489	-53.2		27	12,503	-53.1		30	12,165	-53.4		28	12,242	-52.0		29	12,479	-53.2	
175	28	13,074	-54.2		27	13,323	-58.3		24	13,336	-59.4		26	13,356	-59.0		30	13,021	-54.6		26	13,095	-53.9		29	13,325	-59.6	
150	28	14,055	-57.0		28	14,278	-64.5		23	14,284	-65.6		25	14,306	-65.5		28	14,005	-57.1		25	14,082	-56.4		29	14,274	-65.9	
125	24	15,203	-59.1		26	15,377	-69.4		22	15,377	-70.0		23	15,398	-70.5		27	15,150	-58.7		23	15,231	-58.0		26	15,367	-70.8	
100	23	16,596	-60.2		24	16,703	-70.2		21	16,698	-69.3		19	16,712	-71.5		25	16,540	-58.4		19	16,653	-58.5		24	16,679	-71.6	
80	18	17,992	-58.0		18	18,042	-64.7		18		-65.7		16	18,039	-66.6		24	17,946	-57.3		17	18,056	-58.8		22		-68.5	
60	11	19,801	-54.7		14	19,824	-59.3		14	19,808	-61.4		13	19,798	-61.6		15	19,779	-55.4		11	19,877	-56.2		17	19,752	-62.3	
50	7	20,976	-53.2		8	20,956	-56.7		11	20,949	-58.6		8	20,918	-58.3		7	20,942	-53.8		7	21,044	-54.4		15	20,885	-57.9	
40					7	22,370	-54.9		9	22,365	-55.5		5	22,352	-54.5										9	22,322	-52.5	
30									5	24,225	-53.2		5	24,210	-50.5													

	BUFFALO, N. Y. (991 MB.)				BURRWOOD, LA. (1015 MB.)				CAMAGUEY, CUBA (1001 MB.)				CARIBOU, MAINE (992 MB.)				CHARLESTON, S. C. (1015 MB.)				CIUDAD VICTORIA, MEX. (973 MB.)				COLUMBIA, MO. (987 MB.)			
SURFACE	31	221	18.7	74	31	3	28.5	82	29	122	24.6	93	31	191	14.7	87	30	13	24.2	91	26	335	29.2	60	29	239	22.8	82
1,000	31	140			31	138	27.9	80	29	132	24.6	93	31	122			30	142	26.0	78	26	91			29	125		
950	31	589	18.9	63	31	597	25.2	76	29	591	24.1	80	31	565	15.0	69	30	596	24.3	69	26	551	28.0	60	29	580	24.0	66
900	31	1,046	15.9	63	31	1,067	22.7	69	29	1,057	22.2	69	31	1,016	12.6	71	30	1,067	21.7	68	26	1,028	24.7	64	29	1,048	21.1	65
850	31	1,529	12.6	66	31	1,564	19.8	65	29	1,553	19.1	68	31	1,494	9.9	72	30	1,561	18.4	67	26	1,528	21.0	69	29	1,541	18.4	58
800	31	2,035	9.7	62	31	2,084	16.7	64	29	2,072	16.1	65	31	1,996	7.3	70	30	2,079	15.2	65	26	2,051	17.3	72	29	2,060	16.6	43
750	31	2,576	7.1	55	31	2,634	13.6	59	29	2,616	13.0	61	30	2,533	4.3	67	30	2,630	12.4	54	26	2,604	13.6	72	29	2,613	13.8	40
700	31	3,134	4.5	45	31	3,210	10.5	56	29	3,197	9.9	54	31	3,084	1.9	59	30	3,200	9.2	54	26	3,179	10.2	69	29	3,186	10.2	41
650	31	3,737	1.3	41	31	3,830	7.2	53	29	3,811	6.7	49	31	3,684	- 1.1	55	30	3,817	5.7	54	25	3,798	6.9	63	29	3,804	6.2	42
600	31	4,374	- 2.1	32	31	4,480	3.6	45	29	4,463	2.9	47	31	4,314	- 4.4	48	30	4,462	2.0	49	25	4,447	3.1	59	29	4,449	2.2	41
550	30	5,059	- 6.2		31	5,185	- 0.5	41	29	5,171	- 1.3	50	31	4,998	- 8.7	41	30	5,166	- 1.8	47	24	5,154	- 0.9	56	29	5,148	- 2.3	40
500	30	5,798	-10.6	32	31	5,937	- 5.0	37	28	5,917	- 5.7	43	31	5,726	-13.4	39	30	5,913	- 6.0	46	22	5,905	- 5.3	55	29	5,898	- 6.3	33
450	30	6,603	-15.9		31	6,768	-10.3	36	26	6,744	-10.7	45	31	6,524	-18.7	39	30	6,744	-10.8	42	22	6,736	- 9.9	48	28	6,721	-11.9	32
400	30	7,478	-21.8		31	7,656	-16.3	39	27	7,634	-16.1	40	31	7,388	-24.8	40	30	7,629	-16.6	40	22	7,627	-15.6	43	28	7,609	-18.1	
350	30	8,447	-28.8		31	8,646	-23.3	34	26	8,625	-23.1	40	31	8,345	-32.0		30	8,618	-23.6	37	21	8,621	-22.5	42	28	8,593	-24.9	
300	29	9,537	-36.4		31	9,756	-31.6		24	9,736	-31.5		31	9,417	-39.6		30	9,725	-32.0	36	20	9,736	-30.7		27	9,696	-33.4	
250	29	10,778	-44.9		31	11,020	-41.3		23	11,001	-41.4		31	10,641	-47.3		30	10,987	-42.1		19	11,006	-40.5		27	10,950	-43.3	
200	28	12,245	-51.6		31	12,497	-53.4		23	12,477	-53.6		31	12,099	-51.7		30	12,457	-54.3		19	12,490	-52.8		27	12,418	-53.5	
175	28	13,105	-54.3		31	13,342	-60.0		23	13,323	-60.0		30	12,967	-52.3		30	13,300	-60.5		18	13,341	-59.1		27	13,266	-58.8	
150	26	14,089	-57.1		31	14,290	-66.1		22	14,272	-66.0		28	13,963	-53.9		29	14,247	-66.2		18	14,293	-65.6		27	14,219	-64.5	
125	24	15,241	-59.8		31	15,381	-70.7		20	15,370	-70.7		28	15,129	-55.2		29	15,340	-69.9		16	15,388	-71.2		24	15,321	-67.8	
100	21	16,633	-60.4		29	16,700	-70.7		15	16,687	-71.7		25	16,557	-55.1		25	16,672	-68.6		14	16,698	-73.3		23	16,669	-66.8	
80	16	18,017	-57.7		27		-67.2		9	18,014	-69.1		20	17,987	-54.4		24		-64.7		10	18,019	-69.4		19	18,036	-63.7	
60	12	19,845	-54.5		17	19,785	-60.8		9	19,751	-63.5		10	19,820	-52.3		20	19,803	-60.2		10	19,753	-63.8		16	19,822	-58.2	
50	8	20,997	-53.2		11	20,931	-57.9		8	20,879	-59.9		6	20,990	-51.6		18	20,946	-58.1		9	20,882	-59.8		13	20,986	-56.0	
40									5	22,274	-56.1						8	22,349	-55.0		7	22,294	-55.6		12	22,408	-53.2	
30																					5	24,138	-53.2					

	DODGE CITY, KANS. (924 MB.)				EL PASO, TEX. (881 MB.)				ELY, NEV. (810 MB.)				GLASGOW, MONT. (939 MB.)				GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (887 MB.)				GREENSBORO, N. C. (985 MB.)			
SURFACE	31	792	25.2	62	31	1,195	29.1	38	31	1,908	20.0	35	31	648	20.2	53	31	1,474	23.9	36	31	1,128	18.7	49	31	273	22.6	87
1,000	31	86			31	44			31	38			31	93			31	39			31	83			31	143		
950	31	548			31	520			31	505			31	546			31	507			31	534			31	598	23.8	69
900	31	1,025	26.4	53	31	1,006			31	986			31	1,010	19.3	48	31	990			31	1,003			31	1,065	21.1	68
850	31	1,528	24.0	51	31	1,510	27.9	36	31	1,483			31	1,499	16.1	52	28	1,490	24.4	36	31	1,493	17.3	46	31	1,558	17.7	70
800	31	2,056	20.5	52	31	2,044	23.7	41	31	2,011	21.5	30	31	2,011	12.3	55	31	2,021	23.0	32	31	2,008	13.8	48	31	2,075	14.4	70
750	31	2,614	16.8	54	31	2,609	19.0	47	31	2,572	18.4	29	31	2,558	8.5	57	31	2,583	18.4	35	31	2,554	9.7	53	31	2,620	11.0	68
700	31	3,195	12.6	53	31	3,193	14.0	54	31	3,153	13.5	32	31	3,116	4.5	58	31	3,165	13.4	40	31	3,117	5.3	60	31	3,191	8.4	54
650	31	3,816	8.0	53	31	3,817	9.0	61	31	3,771	8.1	38	30	3,722	0.4	57	31	3,783	8.0	47	31	3,723	1.0	63	31	3,806	5.4	49
600	31	4,468	3.3	51	31	4,471	3.8	66	31	4,425	2.4	46	30	4,354	- 3.9	53	31	4,437	2.6	53	31	4,357	- 3.7	50	31	4,451	1.8	49
550	31	5,170	- 1.5	47	31	5,175	- 1.1	65	31	5,123	- 3.5	54	30	5,038	- 8.3	47	31	5,137	- 2.7	53	31	5,044	- 8.2	54	31	5,513	- 2.1	47
500	31	5,921	- 6.1	40	31	5,927	- 5.8	58	31	5,868	- 9.2	54	30	5,769	-13.1	43	30	5,882	- 8.2	49	31	5,772	-13.1	52	31	5,900	- 6.1	41
450	31	6,745	-11.0	34	31	6,751	-10.5	46	31	6,683	-13.9	40	30	6,571	-18.2	39	30	6,701	-13.3	40	31	6,571	-18.4	45	31	6,728	-10.8	
400	31	7,634	-17.1	29	31	7,643	-16.0	34	31	7,561	-19.9	36	30	7.434	-24.3	37	30	7,580	-19.7		31	7,435	-24.7	42	31	7,615	-16.8	
350	30	8,621	-24.0		31	8,635	-23.0		31	8,537	-27.1		30	8,393	-31.5	37	30	8,557	-26.5		31	8,392	-31.9	40	31	8,603	-24.0	
300	30	9,727	-32.0		30	9,745	-31.3		30	9,629	-35.1		30	9,466	-39.4		30	9,653	-34.6		31	9,463	-39.8		30	9,710	-32.2	
250	30	10,987	-42.3		29	11,008	-41.3		30	10,877	-43.4		30	10,690	-48.1		30	10,902	-43.9		31	10,686	-48.2		30	10,971	-41.7	
200	30	12,459	-53.3		29	12,486	-52.8		29	12,346	-51.4		30	12,143	-51.6		27	12,373	-53.3		29	12,138	-53.1		30	12,448	-52.4	
175	30	13,307	-58.6		27	13,334	-58.9		29	13,206	-54.9		29	13,006	-52.4		27	13,223	-57.9		29	12,997	-53.4		30	13,299	-58.3	
150	29	14,263	-64.2		27	14,286	-65.6		27	14,183	-58.8		30	13,999	-53.9		27	14,184	-62.5		28	13,987	-54.6		30	14,256	-63.5	
125	28	15,363	-69.3		26	15,377	-70.7		25	15,322	-62.0		30	15,164	-55.4		25	15,291	-66.2		26	15,148	-56.6		30	15,363	-67.2	
100	27	16,690	-68.7		20	16,694	-71.8		24	16,699	-62.7		29	16,587	-55.7		24	16,641	-65.7		25	16,664	-56.5		27	16,705	-65.5	
80	22	18,041	-63.6		19	18,024	-67.1		23	18,078	-60.6		25	18,012	-55.7		23	18,006	-62.1		23	17,981	-56.2		27		-62.7	
60	18	19,826	-58.8		17	19,792	-60.8		23	19,879	-57.4		23	19,851	-53.5		16	19,795	-57.4		20	19,802	-54.6		22	19,862	-58.4	
50	16	20,978	-56.8		13	20,937	-58.3		22	21,026	-55.4		10	21,012	-52.9		9	20,959	-55.3		15	20,968	-53.5		14	21,022	-56.5	
40	10	22,397	-53.3		8	22,343	-55.2		20	22,448	-53.2		5	22,443	-51.5						10	22,410	-51.5					
30					6	24,192	-52.0		16	24,288	-51.1																	
20									8	26,955	-48.3																	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

AUGUST 1951

Standard pressure surface (mb.)	HATTERAS, N. C. (1016 MB.)				HAVANA, CUBA (1010 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (973 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	25.6	85	31	49	26.4	85	31	9	25.6	75	31	361	14.7	86
1,000	31	141	25.0	80	31	134	27.0	81	31	127	24.6	77	31	124		
950	31	593	22.4	74	31	595	24.8	76	31	585	21.1	79	29	567	16.5	75
900	31	1,060	19.7	72	31	1,062	22.3	71	31	1,043	17.8	82	31	1,021	13.6	74
850	31	1,551	16.8	68	31	1,558	19.4	70	31	1,531	14.8	83	31	1,501	10.7	75
800	31	2,066	13.6	67	31	2,078	16.3	67	31	2,043	13.0	78	31	2,005	8.5	70
750	31	2,613	10.5	64	31	2,626	13.2	66	31	2,596	11.3	64	31	2,544	5.6	66
700	31	3,181	7.8	59	31	3,204	10.2	57	31	3,160	9.5	45	31	3,098	2.6	62
650	31	3,795	4.5	53	31	3,821	6.8	53	31	3,785	7.7		31	3,698	-0.7	61
600	31	4,438	0.9	48	31	4,472	3.1	52	31	4,429	4.9		31	4,329	-4.7	58
550	31	5,136	-2.9	47	31	5,179	-0.9	53	31	5,140	1.3		31	5,015	-8.6	50
500	31	5,882	-7.0	44	31	5,928	-5.2	50	30	5,895	-3.2		31	5,742	-13.0	45
450	31	6,708	-11.9	42	31	6,761	-10.0	50	30	6,728	-8.7		30	6,543	-18.4	42
400	31	7,590	-17.4	39	31	7,649	-15.7	46	30	7,623	-15.2		30	7,408	-24.6	40
350	31	8,577	-24.1	40	31	8,642	-22.6	43	30	8,616	-23.0		29	8,362	-31.9	
300	31	9,682	-32.2	39	31	9,754	-30.9	39	30	9,726	-31.9		29	9,433	-40.0	
250	30	10,948	-41.2		31	11,021	-40.8		29	10,987	-42.0		29	10,657	-47.7	
200	30	12,428	-51.9		31	12,500	-52.9		30	12,461	-53.5		28	12,111	-52.5	
175	30	13,282	-57.3		31	13,348	-59.3		30	13,307	-59.6		26	12,968	-52.9	
150	30	14,245	-62.0		31	14,297	-65.6		30	14,256	-66.0		25	13,961	-54.9	
125	30	15,360	-66.0		29	15,392	-70.2		30	15,346	-71.3		23	15,125	-56.1	
100	28	16,706	-65.9		26	16,712	-71.8		28	16,655	-72.5		22	16,537	-56.4	
80	21		-62.7		25		-69.2		28	17,972	-69.9		19	17,957	-55.8	
60	19	19,870	-58.4		22	19,758	-63.2		26	19,707	-64.4		11	19,782	-54.1	
50	14	21,023	-56.2		21	20,889	-59.8		25	20,828	-61.3		5	20,962	-53.6	
40	12	22,453	-53.2		15	22,289	-56.5		22	22,226	-57.6					
30	8	24,300	-52.1		5	24,145	-53.2		18	24,055	-53.8					
20									11	26.675	-49.5					

Standard pressure surface (mb.)	JOLIET, ILL. (995 MB.)				LAKE CHARLES, LA. (1015 MB.)				LANDER, WYO. (830 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	179	18.5	88	31	5	27.2	85	31	1,696	19.3	42
1,000	31	132			31	136	27.9	76	31	54		
950	31	580	19.7	69	30	597	26.4	69	31	513		
900	31	1,041	17.3	65	31	1,068	23.6	65	31	992		
850	30	1,528	15.0	60	31	1,565	20.5	62	31	1,487		
800	31	2,040	12.8	54	31	2,087	17.3	59	31	2,013	19.9	37
750	31	2,583	10.1	49	31	2,639	14.1	57	31	2,568	15.7	39
700	31	3,150	7.1	44	31	3,215	10.6	53	31	3,146	10.9	44
650	31	3,759	3.7	40	31	3,836	7.1	48	31	3,760	5.9	49
600	31	4,402	0.0	39	31	4,482	3.4	43	31	4,408	0.7	53
550	31	5,096	-4.0	37	31	5,190	-0.6	39	31	5,101	-4.7	53
500	31	5,840	-8.4	30	31	5,939	-5.1	37	31	5,843	-10.0	40
450	31	6,656	-13.8		30	6,769	-10.3	36	31	6,654	-15.3	41
400	31	7,535	-20.2		30	7,656	-16.3	36	31	7,526	-21.7	38
350	31	8,511	-26.8		30	8,645	-23.5	34	31	8,495	-29.1	37
300	31	9,606	-34.5		30	9,752	-31.8		31	9,578	-37.3	40
250	31	10,857	-43.3		29	11,014	-41.7		31	10,812	-46.2	
200	30	12,336	-52.6		29	12,488	-53.2		31	12,269	-53.5	
175	30	13,190	-57.0		29	13,335	-59.2		31	13,122	-56.2	
150	30	14,155	-61.1		29	14,286	-65.5		31	14,095	-58.3	
125	30	15,278	-64.0		28	15,380	-70.7		31	15,233	-61.1	
100	28	16,640	-63.5		26	16,695	-72.1		29	16,602	-61.5	
80	26	18,019	-60.9		24		-67.7		28	17,987	-59.7	
60	20	19,805	-57.1		20	19,775	-62.3		20	19,807	-56.4	
50	13	20,946	-54.7		19	20,910	-59.1		11	20,956	-55.3	
40	6	22,391	-54.8		11	22,310	-55.7					
30					8	24,138	-53.3					
20					6	26,778	-48.2					

Standard pressure surface (mb.)	LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1005 MB.)				MEDFORD, ORE. (966 MB.)				MAZATLAN, MEXICO (1007 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	660	31.0	26	31	79	25.8	82	31	401	25.8	30	23	14	29.7	76
1,000	31	34			31	126	26.3	78	31	91			23	76	29.3	76
950	31	503			30	586	26.8	64	30	551	25.4	29	23	542	26.4	75
900	31	987	31.0	26	31	1,059	24.0	63	31	1,016	22.1	32	23	1,010	23.8	75
850	31	1,495	26.9	27	31	1,558	21.4	59	31	1,509	18.4	36	22	1,509	21.2	70
800	31	2,026	22.3	31	31	2,081	18.5	57	31	2,025	14.6	41	22	2,033	18.6	63
750	31	2,583	17.5	35	31	2,636	15.2	54	31	2,570	10.7	44	22	2,588	15.6	58
700	31	3,166	12.6	36	31	3,213	11.4	52	31	3,138	7.0	43	22	3,167	12.0	63
650	31	3,785	7.4	39	31	3,834	7.4	53	31	3,745	3.0	37	20	3,784	8.0	65
600	31	4,436	2.7	39	30	4,483	3.4	52	31	4,387	-1.5	33	21	4,441	3.7	67
550	31	5,138	-1.7	38	30	5,192	-0.6	46	31	5,076	-6.4	33	20	5,143	-1.0	67
500	31	5,887	-7.0		30	5,940	-5.1	43	31	5,811	-11.6	30	21	5,898	-5.5	59
450	31	6,709	-12.2		30	6,770	-10.0	35	31	6,613	-17.2		21	6,723	-10.2	50
400	30	7,590	-18.4		30	7,659	-16.0	31	31	7,482	-23.8		21	7,617	-15.7	
350	30	8,573	-25.5		30	8,650	-23.1		31	8,442	-31.2		20	8,608	-22.7	
300	30	9,673	-33.5		30	9,758	-31.8		31	9,518	-38.9		20	9,719	-31.0	
250	30	10,929	-42.0		30	11,020	-41.7		31	10,745	-47.2		19	10,987	-40.6	
200	30	12,408	-52.1		30	12,498	-52.7		30	12,201	-52.8		16	12,470	-52.3	
175	30	13,261	-57.7		29	13,346	-58.5		28	13,059	-54.2		14	13,314	-59.1	
150	30	14,222	-63.0		29	14,300	-64.6		28	14,042	-56.3		12	14,263	-66.5	
125	30	15,332	-66.7		29	15,398	-69.5		28	15,193	-58.6		7	15,340	-73.5	
100	29	16,677	-67.1		27	16,722	-70.1		25	16,581	-58.9					
80	25	18,034	-63.6		23	18,061	-65.5		22	17,976	-58.5					
60	21	19,818	-59.0		18	19,840	-59.9		16	19,801	-56.7					
50	18	20,978	-56.2		16	20,992	-57.0		13	20,958	-54.6					
40	11	22,399	-54.0		13	22,413	-53.9		7	22,396	-53.2					
30					8	24,265	-50.9		5	14,246	-50.5					
20					7	26,920	-48.5									

Standard pressure surface (mb.)	MERIDA, MEXICO (1011 MB.)				MIAMI, FLA. (1016 MB.)				NANTUCKET, MASS. (1014 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	26	27	26.8	81	31	4	27.0	81	31	14	18.4	91
1,000	26	121	26.4	80	31	146	27.2	77	31	133	19.5	83
950	26	578	24.5	75	31	602	24.5	76	31	578	18.4	72
900	26	1,048	21.8	75	31	1,073	21.7	72	31	1,038	16.2	68
850	26	1,543	18.8	75	31	1,568	18.7	72	31	1,523	13.3	69
800	26	2,061	15.6	74	31	2,087	15.7	70	31	2,031	10.9	61
750	26	2,607	12.7	69	31	2,634	12.7	66	31	2,577	8.0	52
700	26	3,185	9.8	61	31	3,210	9.5	63	31	3,134	5.0	48
650	26	3,801	6.4	60	31	3,824	6.1	61	30	3,739	2.0	40
600	26	4,451	2.8	56	31	4,474	2.3	59	29	4,379	-1.4	39
550	26	5,154	-1.2	57	31	5,177	-1.7	56	29	5,074	-5.2	34
500	26	5,904	-5.7	55	31	5,926	-5.9	51	29	5,810	-9.7	31
450	26	6,731	-10.6	52	31	6,750	-10.7	44	29	6,622	-14.7	
400	26	7,621	-16.2	50	31	7,640	-16.6	38	29	7,497	-20.8	
350	26	8,611	-23.1	46	31	8,628	-23.6	34	29	8,470	-27.7	
300	25	9,719	-31.6		31	9,735	-32.2		29	9,561	-35.5	
250	24	10,983	-41.6		31	10,996	-42.3		29	10,806	-43.9	
200	23	12,456	-54.1		31	12,465	-54.8		29	12,277	-51.8	
175	22	13,297	-60.7		31	13,305	-61.3		29	13,134	-55.6	
150	20	14,240	-67.4		31	14,246	-67.4		28	14,103	-59.2	
125	12	15,312	-72.8		26	15,333	-70.8		28	15,237	-61.9	
100	11	16,609	-74.5		23	16,658	-70.0		22	16,613	-61.7	
80	9	17,935	-71.9		17	18,003	-66.9		21	18,001	-59.5	
60	5	19,668	-64.8		12	19,770	-62.3		17	19,816	-57.2	
50					11	20,912	-57.5		10	20,969	-55.8	
40					7	22,342	-52.5					
30					7	24,216	-48.7					
20												

Standard pressure surface (mb.)	NASHVILLE, TENN. (995 MB.)				NORTH PLATTE, NEBR. (917 MB.)				OAKLAND, CALIF. (1012 MB.)				OKLAHOMA CITY, OKLA. (969 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	177	25.4	73	31	849	20.8	81	31	6	15.7	77	30	391	27.7	63
1,000	31	132			31	89			31	110	14.5	78	30	105		
950	31	586	25.5	59	31	544			31	558	19.2	57	30	569	28.8	53
900	31	1,060	22.4	62	31	1,013	22.1	67	31	1,014	22.1	29	30	1,044	26.7	53
850	31	1,554	18.8	65	31	1,510	20.9	60	31	1,508	20.1	25	30	1,547	23.3	56
800	31	2,073	15.8	57	31	2,033	18.2	55	31	2,027	17.0	24	30	2,073	19.5	58
750	31	2,618	12.7	52	31	2,590	14.6	56	31	2,579	13.5		30	2,628	15.5	57
700	31	3,194	9.5	47	31	3,163	10.5	55	31	3,150	9.8		30	3,207	11.4	56
650	31	3,807	6.4	46	30	3,782	6.5	52	31	3,763	5.7		30	3,828	7.9	48
600	31	4,458	2.7	46	30	4,427	2.0	49	31	4,410	1.4		30	4,478	3.7	46
550	30	5,159	-1.5	42	30	5,126	-3.0	50	31	5,105	-3.5		30	5,181	-0.7	43
500	31	5,909	-6.0	38	30	5,871	-7.9	47	31	5,850	-8.9		30	5,935	-4.9	35
450	31	6,734	-10.7	34	30	6,693	-13.2	44	31	6,664	-15.0		30	6,763	-9.8	
400	31	7,623	-16.6		30	7,570	-19.1	45	31	7,537	-21.4		30	7,655	-15.8	
350	30	8,611	-23.7		30	8,550	-25.9	39	31	8,507	-28.8		30	8,647	-22.9	
300	31	9,718	-32.1		30	9,648	-33.9	38	31	9,692	-36.8		30	9,758	-31.5	
250	29	10,980	-41.5		30	10,901	-43.2		30	10,829	-44.8		30	11,021	-41.5	
200	29	12,455	-52.9		29	12,367	-53.7		30	12,297	-51.5		30	12,498	-52.6	
175	29	13,303	-58.9		29	13,215	-58.0		30	13,158	-54.5		30	13,348	-58.4	
150	29	14,256	-64.9		29	14,177	-61.7		30	14,135	-58.5		30	14,303	-64.5	
125	28	15,354	-69.9		27	15,292	-65.4		30	15,270	-61.7		30	15,400	-69.8	
100	27	16,678	-69.5		22	16,649	-65.8		29	16,647	-62.1		24	16,715	-70.0	
80	23		-64.8		18	18,016	-62.7		26	18,026	-61.3		20	18,057	-64.9	
60	20	19,806	-59.1		15	19,814	-57.8		20	19,822	-57.6		17	19,836	-59.3	
50	17	20,953	-57.0		13	20,973	-55.9		9	20,987	-55.5		12	20,978	-56.6	
40	14	22,357	-54.9		5	22,407	-54.3		5	22,426	-53.5		10	22,405	-54.0	
30	9	24,225	-52.0										6	24,259	-51.4	
20																

Standard pressure surface (mb.)	OMAHA, NEBR. (979 MB.)				PHOENIX, ARIZ. (970 MB.)				PITTSBURGH, PA. (972 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	308	23.0	77	31	338	32.2	44	29	382	21.2	65
1,000	31	119			31	60			29	136		
950	31	574	23.1	67	31	525	32.7	38	29	588	21.2	59
900	31	1,040	20.7	67	31	1,011	29.3	38	29	1,051	18.2	61
850	31	1,533	18.0	63	31	1,517	25.3	41	29	1,538	14.8	63
800	31	2,051	15.8	57	31	2,045	21.1	44	29	2,049	11.9	59
750	31	2,601	13.0	50	31	2,603	16.7	48	29	2,595	9.1	48
700	31	3,174	9.5	48	31	3,183	12.2	51	29	3,156	6.4	38
650	30	3,789	5.8	47	31	3,805	7.7	52	29	3,766	3.5	34
600	30	4,436	1.6	49	31	4,455	3.5	49	29	4,405	0.0	31
550	30	5,136	-3.0	47	31	5,158	-0.7	44	29	5,099	-3.9	32
500	30	5,882	-7.5	42	31	5,911	-5.6	39	29	5,843	-8.4	
450	30	6,707	-12.3	40	31	6,734	-10.7		29	6,657	-13.2	34
400	30	7,587	-18.3	39	30	7,626	-16.7		29	7,539	-19.3	34
350	30	8,570	-25.4	38	30	8,614	-23.6		29	8,517	-26.6	
300	30	9,671	-33.7		30	9,722	-31.8		29	9,612	-34.5	
250	30	10,925	-43.3		29	10,983	-41.1		29	10,862	-43.2	
200	30	12,396	-53.2		27	12,467	-52.4		28	12,334	-52.2	
175	29	13,248	-57.7		27	13,317	-58.5		28	13,190	-55.8	
150	29	14,210	-62.1		26	14,271	-64.6		28	14,160	-60.1	
125	28	15,327	-66.7		24	15,373	-69.8		27	15,288	-62.5	
100	26	16,676	-65.8		21	16,693	-70.1		27	16,665	-62.4	
80	21	18,042	-62.8		21	18,034	-65.0		24	18,051	-59.6	
60	19	19,833	-57.8		20	19,807	-59.6		21	19,861	-56.2	
50	17	20,988	-55.8		15	20,952	-56.9		16	21,030	-54.5	
40	14	22,415	-53.3		9	22,396	-53.7		13	22,466	-52.7	
30	11	24,281	-51.3		7	24,265	-50.4					
20	6	26,920	-48.6									

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

AUGUST 1951

Standard pressure surface (mb.)	PORTLAND, MAINE (1013 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (978 MB.)				SAN ANTONIO, TEX. (986 MB.)				SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1005 MB.)				S. STE. MARIE, MICH. (990 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	• Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	20	16.8	92	31	966	19.3	65	31	317	17.2	84	31	240	30.9	49	31	19	26.8	82	31	71	13.9	88	31	221	13.5	89
1,000	31	128	18.3	83	31	84			31	122			31	112			31	138	26.4	81	31	114	13.7	88	31	138		
950	31	574	18.0	75	31	536			31	568	18.1	73	31	577	28.6	54	31	595	23.6	81	31	563	17.0	69	31	576	14.9	73
900	31	1,031	15.4	75	31	1,006			31	1,025	15.8	72	31	1,053	25.2	60	31	1,062	20.7	80	31	1,016	22.6	30	31	1,031	12.6	71
850	31	1,514	12.5	74	31	1,502	19.9	52	31	1,509	13.4	69	31	1,553	21.7	64	31	1,555	18.2	73	31	1,512	21.1	25	31	1,509	10.2	65
800	31	2,021	9.7	70	31	2,022	16.4	54	31	2,018	10.9	61	31	2,076	18.0	67	31	2,074	15.7	66	31	2,033	18.4	20	31	2,011	7.6	57
750	31	2,563	6.8	64	31	2,574	12.6	54	31	2,564	8.3	56	31	2,629	14.9	58	31	2,619	13.0	60	31	2,587	14.8	21	31	2,547	5.5	58
700	31	3,118	3.7	54	31	3,144	8.9	54	31	3,122	5.5	50	31	3,207	11.8	47	31	3,198	10.1	54	31	3,162	11.0	22	31	3,103	2.7	48
650	30	3,721	0.3	50	31	3,756	4.7	54	31	3,732	2.0	45	30	3,831	8.4	39	30	3,813	6.7	51	31	3,778	7.1		31	3,704	- 0.1	40
600	31	4,354	- 3.1	46	31	4,401	0.0	55	31	4,366	- 1.8	40	31	4,481	4.5	38	30	4,466	3.4	42	31	4,428	2.8		31	4,336	- 3.5	35
550	31	5,040	- 6.8		31	5,095	- 4.8	54	31	5,058	- 6.0	38	31	5,186	0.5	34	29	5,178	- 0.4	41	31	5,128	- 1.8		30	5,019	- 7.8	
500	30	5,777	-11.2	36	31	5,835	- 9.2	44	31	5,793	-10.5	32	31	5,943	- 4.1	31	29	5,925	- 4.7	40	31	5,878	- 6.9		30	5,752	-12.7	35
450	30	6,581	-16.7		31	6,651	-14.5	36	31	6,603	-16.1	32	28	6,775	- 9.2		29	6,757	- 9.5	30	31	6,698	-12.6		30	6,554	-18.3	
400	29	7,453	-22.7		31	7,524	-21.2		31	7,473	-22.4		28	7,670	-15.9		29	7,648	-15.5	28	31	7,579	-19.1		30	7,419	-24.6	32
350	29	8,419	-29.8		31	8,495	-28.3		31	8,440	-29.3		27	8,663	-23.3		29	8,641	-22.8		31	8,560	-26.0		29	8,372	-31.9	
300	28	9,501	-37.5		31	9,582	-36.4		31	9,524	-36.8		25	9,775	-31.5		29	9,752	-31.3		31	9,657	-33.8		29	9,442	-40.1	
250	27	10,741	-45.3		31	10,822	-45.0		31	10,763	-45.5		23	11,036	-41.4		29	11,016	-41.5		30	10,913	-42.0		29	10,662	-48.9	
200	27	12,205	-52.2		31	12,284	-53.0		30	12,227	-52.0		21	12,517	-52.7		29	12,490	-53.9		30	12,397	-50.0		29	12,112	-51.9	
175	21	13,060	-55.2		30	13,141	-55.7		30	13,086	-54.5		19	13,371	-58.7		28	13,334	-60.5		30	13,261	-54.7		28	12,981	-53.2	
150	19	14,042	-57.2		30	14,115	-59.1		30	14,066	-56.9		19	14,324	-65.1		28	14,278	-66.9		30	14,234	-59.8		28	13,969	-55.2	
125	19	15,188	-59.4		25	15,252	-61.7		29	15,212	-59.2		18	15,419	-70.6		28	15,366	-71.3		30	15,360	-64.3		27	15,127	-56.3	
100	19	16,582	-59.0		23	16,634	-61.4		27	16,609	-60.2		18	16,734	-71.7		27	16,679	-72.6		30	16,716	-65.7		24	16,546	-57.6	
80	17	17,981	-57.4		20	18,026	-59.4		25	18,004	-58.0		17		-68.0		23	17,996	-70.5		29	18,072	-63.9		22	17,959	-56.5	
60	10	19,798	-55.5		13	19,853	-56.6		16	19,815	-55.9		17	19,814	-61.5		20	19,723	-64.3		26	19,858	-60.3		7	19,788	-54.0	
50	8	20,963	-53.7		6	21,019	-54.6		10	20,989	-54.6		14	20,954	-58.2		18	20,845	-60.8		23	21,001	-57.7					
40									5	22,429	-52.0		10	22,377	-54.4		17	22,242	-57.3		17	22,411	-55.1					
30													6	24,238	-49.7		7	24,068	-52.6		13	24,256	-51.8					
20																					7	26,879	-50.4					
15																					6	28,741	-49.3					

Standard pressure surface (mb.)	SPOKANE, WASH. (929 MB.)				SWAN ISLAND, W. I. (1012 MB.)				TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1015 MB.)				TATOOSH ISLAND, WASH. (1014 MB.)				TOLEDO, OHIO (994 MB.)				WASHINGTON, D. C. (1006 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	722	23.5	31	30	10	27.3	85	26	2,306	16.7	72	31	9	26.5	84	31	31	12.3	92	31	191	19.4	79	31	88	21.6	85
1,000	31	73			30	119	27.5	81	26	67			31	145	26.7	80	31	145	12.2	89	31	134			31	142	23.1	78
950	31	531			30	579	24.6	80	26	529			31	600	24.7	77	31	582	13.3	69	31	580	19.8	63	31	593	22.0	68
900	31	1,000	22.3	30	30	1,046	21.6	78	26	1,008			31	1,073	21.9	75	31	1,031	12.9	54	31	1,042	16.8	65	31	1,059	19.0	67
850	31	1,492	18.4	33	30	1,541	18.6	75	26	1,503			31	1,569	19.1	74	31	1,510	10.8	50	31	1,527	13.8	64	31	1,548	15.7	65
800	31	2,007	13.9	39	30	2,060	15.8	68	26	2,038			31	2,088	16.1	71	31	2,013	8.6	43	31	2,037	12.0	52	31	2,061	12.5	63
750	31	2,550	9.1	45	30	2,605	13.0	61	26	2,592	14.9	71	31	2,640	13.3	66	31	2,550	5.9	36	31	2,586	9.3	49	31	2,605	9.3	58
700	31	3,114	4.8	43	30	3,184	10.1	55	26	3,164	10.9	74	31	3,214	10.4	61	31	3,104	2.8	36	31	3,144	6.2	46	31	3,169	6.3	47
650	30	3,717	1.0	41	30	3,798	6.7	51	26	3,787	6.9	76	31	3,832	6.9	58	31	3,705	- 0.5	37	31	3,755	3.0	42	30	3,780	3.4	37
600	30	4,353	- 3.2	43	30	4,451	3.1	49	26	4,434	2.7	81	31	4,482	3.0	56	31	4,335	- 4.3	34	31	4,393	- 0.5	36	31	4,419	0.1	33
550	30	5,034	- 7.7	40	30	5,156	- 1.0	45	25	5,138	- 1.1	79	31	5,185	- 1.0	54	31	5,018	- 8.4	33	31	5,085	- 4.5	36	31	5,112	- 4.0	
500	30	5,770	-12.8	35	29	5,906	- 5.5	45	25	5,891	- 5.4	71	31	5,937	- 5.2	46	31	5,748	-13.3	36	30	5,827	- 8.8	33	31	5,856	- 8.5	
450	28	6,573	-18.6	34	29	6,731	-10.3	40	25	6,722	-10.0	64	31	6,764	-10.2	43	31	6,540	-19.0	32	30	6,641	-13.9		31	6,673	-13.6	
400	27	7,439	-25.4		29	7,623	-15.7	30	25	7,611	-15.7	54	31	7,656	-15.9	39	31	7,407	-25.7	33	30	7,521	-20.1	32	31	7,551	-19.7	
350	27	8,393	-32.6		29	8,616	-22.9	30	25	8,604	-22.8	56	29	8,647	-22.7	37	31	8,359	-33.2	32	30	8,497	-27.1	32	31	8,528	-26.6	
300	27	9,460	-40.8		29	9,727	-31.3		23	9,715	-31.2	48	29	9,759	-31.0		31	9,423	-41.6		30	9,589	-35.0		30	9,624	-34.6	
250	27	10,681	-48.0		29	10,992	-41.3		21	10,982	-41.3		29	11,025	-41.0		31	10,635	-50.2		29	10,833	-43.6		30	10,873	-43.3	
200	27	12,136	-51.2		29	12,469	-53.6		16	12,465	-53.5		28	12,503	-53.1		30	12,069	-54.1		29	12,303	-52.4		29	12,345	-52.6	
175	27	13,002	-51.9		29	13,314	-60.2		8	13,308	-60.2		27	13,349	-59.9		29	12,921	-53.6		29	13,158	-56.1		29	13,197	-57.2	
150	27	13,997	-53.1		29	14,259	-66.8		5	14,250	-67.0		27	14,296	-66.1		29	13,910	-54.4		29	14,130	-59.3		29	14,161	-61.4	
125	26	15,164	-54.5		27	15,347	-72.2		5	15,333	-72.7		25	15,392	-69.6		28	15,070	-55.1		28	15,267	-62.4		29	15,281	-64.7	
100	24	16,582	-55.3		27	16,651	-73.8						22	16,716	-70.3		25	16,496	-55.5		24	16,649	-62.3		28	16,643	-64.0	
80	20	18,008	-54.9		23	17,961	-71.4						20	18,046	-66.9		22	17,924	-54.9		21	18,029	-60.1		27	18,020	-60.8	
60	13	19,837	-53.2		21	19,689	-64.8						17	19,803	-61.2		10	19,777	-53.4		19	19,838	-56.4		25	19,821	-57.2	
50	7	21,006	-51.7		19	20,813	-60.8						15	20,940	-58.2		5	20,967	-53.2		11	21,013	-54.4		24	20,975	-55.5	
40	5	22,438	-50.4		14	22,212	-56.3						12	22,356	-55.5						5	22,436	-52.9		21	22,398	-53.3	
30					9	24,049	-54.1						8	24,202	-51.1										17	24,266	-50.3	
20													5	26,857	-47.8										12	26,938	-47.1	

• Ascended to 10 mb., 6 obs., 31,402 m., -48.1°C.

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

AUGUST 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	167	3.1	31	196	2.4	12	280	1.9	31	39	1.3	30	164	0.2	31	320	3.1	31	122	6.7	31	289	2.5	28	357	0.8	31	191	1.8	31	360	0.7	31	195	2.4
500	—	—	—	—	—	—	12	298	2.8	—	—	—	—	—	—	—	—	—	31	133	7.4	31	285	3.3	28	263	.9	31	179	2.5	31	318	1.0	—	—	—
1,000	31	167	4.9	—	—	—	11	304	4.3	—	—	—	29	210	.8	31	320	3.5	30	138	6.9	30	265	3.7	27	286	2.6	30	265	.7	31	293	2.1	—	—	—
1,500	31	174	4.5	—	—	—	11	306	5.6	31	56	.9	24	230	2.6	31	299	2.7	24	141	6.3	27	259	4.5	23	275	3.7	30	330	2.4	31	288	3.1	31	198	2.4
2,000	31	172	5.1	31	200	3.3	11	308	7.0	31	249	.6	21	264	4.5	31	263	3.1	23	142	5.7	26	259	5.6	18	268	5.9	27	327	4.1	31	291	4.6	31	202	2.0
2,500	30	169	5.6	31	208	3.5	10	314	6.9	31	264	2.6	20	266	6.3	31	252	4.5	18	134	3.9	24	263	7.0	17	272	7.1	25	322	3.9	28	295	5.5	31	196	1.3
3,000	28	175	4.7	31	218	3.4	10	311	7.9	31	265	5.6	18	270	8.6	31	249	5.5	18	128	3.3	23	268	6.6	16	267	7.9	24	321	4.2	21	292	7.4	30	174	1.5
4,000	27	186	3.8	29	232	4.0				28	263	9.5	13	273	11.7	30	247	7.8	17	111	3.4	21	287	9.3	13	277	7.7	19	311	4.7	17	293	9.2	27	145	1.9
5,000	22	196	3.1	28	228	5.5				17	264	12.0	10	274	12.6	29	256	9.6	12	104	3.8	15	294	12.7	10	277	10.4	16	304	6.0	15	302	9.5	24	184	3.0
6,000	19	224	2.2	26	232	6.9				17	262	14.2				25	255	11.0				10	289	14.6				12	308	8.1	11	313	13.1	21	205	3.0
8,000				21	237	7.5										21	250	13.3																18	204	6.4
10,000				21	237	10.2										15	262	16.5																15	228	6.5
12,000				17	262	14.3																												12	273	8.6
14,000				11	286	8.8																												10	264	9.4

	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
Surface	31	203	4.6	31	295	1.4	31	50	0.3	30	325	0.8	31	91	2.1	31	176	0.5	12	215	3.4	31	307	0.2	31	302	1.3	30	113	3.0	31	200	1.2	31	332	2.5
500	—	—	—	—	—	—	31	238	.5	—	—	—	31	108	2.5	31	274	1.0	—	—	—	31	266	.5	31	305	1.7	30	119	4.0	31	194	1.4	31	328	2.8
1,000	—	—	—	—	—	—	31	267	1.7	30	280	.9	31	75	1.0	29	254	2.1	12	205	4.8	31	270	1.4	31	327	2.3	30	108	2.9	29	324	1.0	31	309	3.1
1,500	—	—	—	31	289	1.8	31	286	3.1	28	277	1.5	30	360	1.7	27	271	3.6	12	205	5.6	28	287	3.3	31	316	2.1	30	76	1.7	24	353	2.4	31	286	3.6
2,000	31	209	4.6	31	264	2.6	31	298	5.0	26	257	2.8	24	335	2.2	22	281	5.9	12	211	5.5	24	293	3.4	31	264	2.1	30	69	1.6	19	5	3.9	29	275	4.6
2,500	31	221	4.8	31	246	2.7	30	298	5.7	23	248	4.0	23	338	2.7	14	275	5.6	12	219	5.9	23	300	3.4	29	235	2.8	28	72	1.4	16	13	4.6	27	276	5.1
3,000	31	226	4.4	30	243	3.9	29	297	6.7	20	261	6.3	21	342	3.0	13	281	6.6	12	221	6.1	19	303	4.4	27	215	2.5	28	80	1.1	14	20	4.1	24	290	5.5
4,000	31	223	5.4	30	234	5.7	28	301	9.0	15	283	9.6	17	324	3.6	10	303	7.7	12	224	5.1	16	298	4.9	25	242	3.6	24	101	2.5				20	303	8.1
5,000	26	229	7.4	24	244	7.4	25	300	9.8	11	283	11.6	15	308	2.5				11	222	6.5	12	294	7.3	24	249	5.0	21	130	1.6				15	310	9.3
6,000	22	233	12.5	21	248	10.5	21	306	11.1	10	274	13.2	13	305	2.9										23	258	4.8	18	160	1.1				14	311	9.3
8,000	15	244	15.7	14	259	15.8	12	290	11.7				10	305	4.4										16	280	7.2	15	87	2.6				11	300	9.9
10,000	12	247	20.1										10	337	3.8										11	283	9.2									

	New York, N.Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)		
Surface	11	143	1.4	31	289	4.7	31	197	4.7	31	132	1.5	31	276	1.6	31	75	1.8	28	162	0.1	31	216	0.8	31	145	4.5	31	263	3.7	30	293	1.1	31	261	3.2
500	11	197	1.2	31	272	3.7	31	198	4.7	31	151	1.8	31	261	1.7	—	—	—	28	67	.3	31	220	1.1	31	148	5.2	31	294	2.6	30	285	1.6	31	285	1.6
1,000	11	270	2.0	29	241	2.9	30	201	5.5	29	190	2.2	30	252	2.2	31	77	1.8	23	246	.5	29	249	2.3	31	147	5.3	30	272	2.1	28	246	1.3	27	332	1.6
1,500				29	228	2.6	29	212	6.2	28	220	4.3	30	239	2.4	29	45	.2	20	284	3.3	27	267	3.6	31	143	5.4	30	255	1.7	23	203	1.1	26	344	2.0
2,000				29	209	2.6	27	221	6.5	26	237	5.1	28	229	1.8	28	238	1.9	19	276	4.4	25	282	4.8	31	148	5.6	29	221	1.7	21	297	.6	25	328	2.8
2,500				29	206	2.4	27	222	6.2	23	264	6.2	27	226	2.0	27	252	4.1	16	285	5.6	23	290	6.8	30	148	4.9	29	200	2.4	18	332	2.8	25	309	3.4
3,000				29	215	2.9	26	227	5.5	23	272	8.1	27	231	3.2	26	266	6.1	14	281	6.6	22	284	7.8	30	139	4.7	29	204	3.4	17	301	4.1	24	303	3.7
4,000				27	217	3.6	25	238	5.1	17	284	12.4	24	222	3.7	23	269	10.7	10	282	12.7	18	277	9.2	27	128	3.1	29	207	4.8	14	312	6.7	21	289	5.7
5,000				27	229	5.4	24	254	5.9	15	280	13.3	21	214	3.6	19	270	13.5				14	279	11.8	25	135	3.2	27	215	6.2	11	316	8.6	21	287	7.9
6,000				26	235	6.6	23	264	6.9	11	283	13.1	20	218	4.0	15	271	15.5				13	290	14.0	22	138	3.3	27	218	7.2	7	285	10.9	19	281	9.6
8,000				23	235	9.9	14	262	6.3				15	231	7.4										15	125	2.0	25	218	9.2	6	298	18.0	13	258	12.7
10,000				15	249	16.1							11	255	7.3													20	226	12.3						
12,000																												15	223	11.7						

	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
Surface	31	228	2.2	31	164	0.6
500	—	—	—	31	204	.9
1,000	31	231	3.1	30	262	1.7
1,500	29	231	4.0	29	272	2.6
2,000	28	242	4.6	26	289	4.1
2,500	27	242	4.7	24	299	5.6
3,000	27	248	5.3	22	305	6.5
4,000	25	258	7.6	19	298	8.3
5,000	20	261	11.0	18	290	10.4
6,000	18	261	11.9	18	287	12.1
8,000	16	260	14.7	15	289	13.6
10,000	10	263	14.6			

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	165	1.3	31	130	4.7	31	82	1.7	31	125	3.8	31	239	1.5	31	272	1.0	31	198	1.3	31	124	1.2	31	41	1.7	31	162	0.8	31	210	1.7	30	152	0.8
500	--	---	----	--	---	----	--	---	----	31	136	8.8	30	180	.8	31	283	2.3	31	196	3.7	31	159	2.7	--	---	----	30	181	2.1	31	237	3.9	30	175	1.0
1,000	--	---	----	31	143	7.2	31	119	2.5	31	135	8.9	29	59	1.7	31	281	2.8	31	227	.8	31	209	3.1	--	---	----	30	224	1.6	30	252	3.4	30	221	1.5
1,500	--	---	----	31	156	8.0	31	206	1.3	31	132	7.5	29	58	4.0	31	267	3.9	31	345	1.5	31	248	3.5	30	39	1.5	30	271	2.2	30	271	3.0	29	253	2.8
2,000	31	233	2.6	31	158	7.0	31	268	3.8	31	124	6.7	29	63	4.8	31	262	5.3	31	345	2.6	31	268	3.9	30	230	1.4	30	298	3.2	30	282	3.1	29	279	3.9
2,500	31	226	3.2	31	165	6.4	31	282	5.7	31	117	6.3	29	62	4.9	30	264	5.7	31	340	2.7	31	286	6.0	30	231	2.7	31	307	4.0	30	284	3.2	29	288	5.1
3,000	31	218	3.4	31	172	4.8	30	288	7.0	31	109	5.9	30	57	4.1	29	269	6.1	31	332	3.0	31	293	7.1	30	239	3.7	31	311	5.1	30	282	4.9	28	293	6.3
4,000	31	237	3.2	30	164	1.5	30	282	10.0	31	107	5.3	30	50	2.5	29	261	7.8	30	312	3.5	28	295	9.7	30	240	4.9	31	311	7.0	30	291	6.5	25	290	8.5
5,000	31	245	4.1	30	34	.7	28	287	12.5	29	100	5.5	30	29	2.0	29	256	9.5	30	306	4.5	27	294	10.7	31	246	6.4	30	311	8.5	31	291	7.4	24	286	10.8
6,000	30	242	5.8	30	34	.2	28	283	14.6	30	99	5.4	31	15	1.8	29	250	10.9	29	311	5.9	23	292	11.8	29	239	10.3	30	312	9.8	31	295	8.9	23	288	12.4
8,000	27	239	7.1	28	184	.5	27	281	20.2	30	81	6.2	31	64	1.7	29	253	16.2	29	309	7.3	20	281	16.0	29	246	14.7	30	307	13.2	31	288	12.0	19	287	17.9
10,000	27	250	9.3	26	145	1.7	26	274	26.9	28	85	5.6	30	74	2.6	28	250	24.8	28	309	10.5	13	271	19.2	25	248	16.8	28	310	17.4	28	297	13.6	16	273	23.0
12,000	24	263	10.6	20	151	.5	20	273	30.1	27	83	2.9	31	85	3.9	25	241	25.4	27	309	8.9				17	256	16.6	22	291	15.1	25	291	12.3	11	284	27.7
14,000	21	277	8.2	17	14	.5	12	268	26.5	24	103	4.5	31	83	5.4	18	240	16.0	25	307	6.4				15	266	12.1	18	278	13.3	23	287	13.9			
16,000	17	248	4.5	10	96	5.0				20	80	6.3	30	70	4.5	17	250	14.9	22	360	5.1				12	278	6.7	13	325	9.9	20	304	5.2			
18,000	12	77	4.1							17	80	12.1	27	84	8.3	13	236	10.4	20	86	3.6				11	233	.5	11	80	1.6	15	98	1.4			
20,000										14	94	15.9	16	76	15.5				15	86	9.0										13	106	4.5			

	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
Surface	31	107	0.3	31	344	4.4	31	45	0.7	25	233	1.3	31	112	0.3	31	285	3.4	31	135	3.4	31	68	1.8	31	140	5.8	31	135	3.2	31	95	0.8	31	277	3.4
500	31	159	2.0	31	343	4.7	31	106	3.0	24	252	4.0	31	101	.7	31	274	5.0	28	141	4.4	--	---	----	31	152	9.4	31	85	6.9	31	135	1.8	31	305	2.8
1,000	31	212	1.5	31	339	5.1	31	100	3.2	24	267	4.3	31	243	1.1	31	269	4.5	28	166	6.4	31	72	1.9	31	153	8.7	31	90	7.2	31	198	2.2	31	301	2.3
1,500	31	254	1.7	31	312	3.6	31	85	3.3	24	272	4.8	31	246	2.5	31	265	2.9	30	191	6.7	31	138	2.4	31	142	5.8	31	90	7.0	31	266	2.7	31	153	.1
2,000	31	284	1.7	31	280	2.7	31	85	2.7	24	261	5.6	31	272	3.6	31	247	2.3	30	204	7.5	31	185	2.4	31	128	3.6	30	89	6.9	31	292	4.2	31	188	.7
2,500	31	311	2.5	30	263	2.8	31	84	2.2	24	257	6.6	30	290	4.6	31	242	1.8	30	228	7.0	31	235	3.2	31	115	3.7	30	91	6.8	31	291	6.2	31	213	1.8
3,000	31	314	3.1	30	250	3.2	31	87	2.3	24	255	6.5	30	300	5.9	30	242	2.1	30	243	6.0	31	257	5.9	31	112	4.5	30	90	6.5	31	288	8.3	31	226	3.1
4,000	31	328	4.6	30	249	4.2	31	63	1.8	22	257	8.7	29	310	7.7	30	233	3.1	30	271	4.2	31	271	10.3	31	113	4.1	30	87	6.9	31	289	11.0	31	236	4.8
5,000	30	327	5.5	31	258	5.2	31	65	1.8	21	252	10.3	28	310	9.3	30	239	4.9	31	292	3.8	30	271	14.5	31	102	3.1	29	89	6.6	31	286	14.0	31	239	5.1
6,000	30	322	4.9	31	262	5.6	31	76	2.4	20	249	10.2	28	308	10.3	30	248	7.0	31	291	4.3	30	274	15.8	30	97	2.9	29	87	6.1	31	285	16.9	31	238	8.0
8,000	30	295	7.4	31	261	7.3	31	60	3.7	20	245	15.6	26	298	11.5	26	247	10.6	31	281	7.2	30	267	20.2	27	83	3.5	29	111	4.5	29	285	22.4	31	234	12.5
10,000	30	282	8.2	29	238	9.3	31	44	4.7	17	248	15.6	27	285	12.5	26	243	16.6	31	259	7.7	31	263	25.1	25	96	2.1	29	129	2.5	26	279	32.0	31	236	16.9
12,000	29	269	7.0	24	247	12.3	31	29	6.0	17	258	20.4	24	279	13.0	20	240	22.9	31	275	8.6	27	264	29.3	20	86	4.0	29	166	1.4	15	270	30.7	27	229	20.6
14,000	28	276	6.2	19	254	14.6	31	50	6.6	12	261	19.1	21	278	12.9	11	240	19.1	31	272	7.5	21	261	24.1	15	90	4.4	29	257	.6	12	278	26.9	26	225	16.7
16,000	27	302	5.4	16	255	12.0	23	62	9.0				18	302	7.2				26	275	5.2	13	87	11.9	12	102	7.5	27	100	5.1	--	---	----	26	205	9.7
18,000	22	72	3.5				16	89	11.7				15	24	1.3				20	103	.7				11	104	9.7	23	90	10.8	10	276	6.5	25	203	4.6
20,000	17	90	7.7				12	93	15.3				13	81	5.4				17	91	4.7				10	84	14.0	18	81	14.8				23	88	5.7
22,000	13	85	10.7																11	77	10.5							16	75	20.6				16	80	7.0
24,000																																		13	88	10.0

	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
Surface	31	353	0.3	31	217	1.3	31	203	4.3
500	31	29	.3	--	---	----	31	286	4.3
1,000	31	305	.8	31	257	2.1	31	311	4.1
1,500	31	274	2.9	31	258	2.8	31	322	3.2
2,000	31	277	4.6	31	254	3.5	31	321	3.6
2,500	30	283	5.7	31	246	3.8	31	319	5.0
3,000	30	285	6.1	31	250	3.9	31	316	5.7
4,000	29	288	7.2	30	248	6.8	30	304	6.6
5,000	27	287	8.8	30	257	8.8	30	302	9.2
6,000	27	283	10.7	27	260	9.7	29	303	9.7
8,000	26	289	15.2	26	249	13.5	27	293	11.2
10,000	20	287	20.9	21	245	16.5	24	303	12.5
12,000	14	290	27.3	13	257	17.4	17	278	14.4
14,000	11	289	18.1				15	260	13.8

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	30	31	1	2	3	4	5	Average	6	7	8	9	10	11	12	Average	13	14	15	16	17	18	19	Average
Langleys	294	204	70	269	169	289	200	214	305	271	20	281	147	193	259	211	203	288	141	134	107	225	343	206
Date	20	21	22	23	24	25	26	Average	27	28	29	30	31	1	2	Average								
Langleys	144	95	261	308	236	270	280	228	349	318	324	334	309	11	25	238								

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	30	31	1	2	3	4	5	Average	6	7	8	9	10	11	12	Average	13	14	15	16	17	18	19	Average
Langleys	145	152	87	136	127	137	153	134	140	143	48	142	116	121	121	119	119	114	91	107	93	121	114	108
Date	20	21	22	23	24	25	26	Average	27	28	29	30	31	1	2	Average								
Langleys	94	96	117	125	136	131	138	120	115	108	101	94	113	7	15	79								

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	30	31	1	2	3	4	5	Average	6	7	8	9	10	11	12	Average	13	14	15	16	17	18	19	Average
Langleys	232	267	111	63	182	97	260	173	137	215	48	295	225	262	269	207	175	149	186	205	164	179	100	165
Date	20	21	22	23	24	25	26	Average	27	28	29	30	31	1	2	Average								
Langleys	150	146	(172)	---	---	---	219	---	177	200	168	157	228	12	29	139								

Note.–Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 30—Solar radiation intensities, tabulated in langleys per minute.

AUGUST 1951

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A.M.				0.0°	P.M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a.m.	1:30 p.m.
TABLE MOUNTAIN, CALIF.											
	Air mass										
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
August										Mb.	Mb.
4	—	—	—	1.39	—	—	—	—	—		
6	—	—	—	1.42	—	—	—	—	—		
7	1.13	1.22	1.31	1.44	—	—	—	—	—		
8	1.21	1.29	1.39	1.50	—	—	—	—	—		
9	—	—	—	1.42	—	—	—	—	—		
10	—	—	—	1.40	—	—	—	—	—		
11	—	—	—	1.47	—	—	—	—	—		
12	—	—	—	1.48	—	—	—	—	—		
19	—	—	—	1.39	—	—	—	—	—		
21	—	—	—	1.45	—	—	—	—	—		
24	—	—	—	1.46	—	—	—	—	—		
25	—	—	—	1.46	—	—	—	—	—		
Averages	1.17	1.26	1.35	1.44	—	—	—	—	—		
Departures	+.02	+.02	+.02	+.01	—	—	—	—	—		
LINCOLN, NEBR.											
	Air mass										
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
August										Mb.	Mb.
1	—	—	—	—	—	1.01	0.88	0.77	0.67	17.7	18.3
3	—	—	—	—	1.34	—	—	—	—	21.8	16.5
6	—	—	—	—	1.32	1.08	.90	.79	.73	23.4	19.6
7	—	—	—	—	1.33	1.10	.94	.82	.73	23.4	21.1
14	—	—	—	—	—	—	.79	.67	.54	18.3	21.1
15	—	—	—	—	1.36	1.14	1.03	.92	.84	16.5	15.9
17	—	—	—	—	1.32	1.10	.90	.79	.71	19.0	21.8
18	—	—	—	—	1.29	1.03	.84	.69	.60	15.9	18.3
Averages	—	—	—	—	1.33	1.08	.90	.78	.69	—	—
Departures	—	—	—	—	+.02	+.03	+.04	+.05	+.07	—	—
MADISON, WIS.											
	Air mass										
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
August										Mb.	Mb.
1	0.66	0.74	0.87	1.01	1.20	—	—	—	—	17.0	17.0
3	.69	.76	.87	—	—	—	—	—	—	17.0	14.2
4	.71	.86	1.02	1.16	1.33	—	—	—	—	11.4	10.6
10	.59	.71	.87	1.04	1.27	—	—	—	—	14.2	14.2
21	.79	.90	.99	1.15	1.34	—	—	—	—	13.7	13.7
22	.77	.88	.99	1.10	1.33	—	—	—	—	12.3	12.3
23	.69	.80	.91	1.13	1.38	—	—	—	—	12.3	13.2
24	.73	.81	.92	1.11	1.29	—	—	—	—	11.0	11.4
Averages	.70	.81	.93	1.10	1.31	—	—	—	—	—	—
Departures	+.06	+.07	+.06	+.05	+.01	—	—	—	—	—	—
BOSTON, MASS.											
	Air mass										
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
										Mb.	Mb.
	NO DATA DURING AUGUST 1951										

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A.M.				0.0°	P.M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a.m.	1:30 p.m.
BLUE HILL, MASS.											
	Air mass										
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
August										Mb.	Mb.
2	0.96	1.04	1.15	1.29	1.49	1.26	1.06	0.93	—	12.4	11.0
4	—	—	1.13	1.28	1.47	1.24	1.09	.99	0.89	14.0	13.1
6	.90	.97	1.07	1.21	—	—	1.07	.97	.87	10.8	8.3
7	—	—	—	1.22	—	—	—	—	—	13.0	13.4
14	—	—	—	—	1.16	—	—	—	—	18.6	18.0
19	.85	.95	1.06	1.20	1.43	1.19	1.02	.90	.77	13.6	13.6
20	.50	.59	—	—	—	—	—	—	—	16.4	19.0
22	—	—	—	—	—	1.06	.91	.78	.74	24.6	16.1
24	.56	.70	.80	—	—	—	—	—	—	14.5	14.9
25	—	—	—	—	—	1.06	.85	.70	.59	15.8	17.6
29	.20	.28	.40	.64	.98	.60	.46	.39	.33	18.8	21.3
30	.43	.55	.66	.87	—	—	—	—	—	20.0	23.0
Averages	.63	.73	.90	1.10	1.31	1.07	.92	.81	.70	—	—
Departures	-.01	-.03	+.02	+.06	+.01	+.05	+.07	+.12	+.10	—	—
ALBUQUERQUE, N.M.											
	Air mass										
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
August										Mb.	Mb.
2	—	—	—	0.99	1.14	—	—	—	—	13.1	10.6
3	—	0.83	0.99	—	—	—	—	—	—	12.7	11.4
5	0.73	—	—	—	—	—	—	—	—	14.6	13.1
6	.84	.95	1.06	1.15	1.43	—	—	—	—	12.2	11.0
7	.87	.95	1.08	1.15	—	—	—	—	—	11.0	13.1
8	—	—	—	1.23	1.45	1.39	1.22	1.12	1.03	6.8	7.0
9	.97	1.05	1.14	1.31	1.48	1.32	—	—	—	4.6	5.6
10	.81	—	—	—	—	—	1.20	1.14	1.06	6.8	7.0
11	.76	.89	1.00	1.18	1.33	1.22	1.09	.95	.78	9.5	10.6
12	.73	.82	.95	1.15	1.37	—	1.01	.86	.73	8.5	10.2
13	.74	—	.99	1.19	1.40	1.27	1.10	.95	.84	10.2	8.8
14	.79	.91	1.05	1.22	1.43	1.25	1.04	.89	.73	8.2	8.5
17	.69	—	.96	1.16	1.37	—	—	—	—	8.8	9.5
18	.70	.84	.98	1.16	1.39	—	.97	—	—	8.2	8.5
19	.73	.86	1.00	1.17	1.41	—	—	—	—	9.1	7.9
20	.95	.99	1.04	1.08	1.25	—	—	—	—	10.2	9.8
24	.82	.93	1.08	1.23	1.41	—	—	—	—	9.8	11.4
25	—	—	—	1.15	—	—	—	—	—	12.7	13.6
27	—	—	—	1.12	—	—	—	—	—	11.4	12.2
29	.95	1.05	1.14	—	—	1.26	1.13	1.02	.92	13.6	13.6
30	—	—	—	—	—	—	1.17	—	—	9.8	7.0
31	1.11	1.21	1.27	1.37	1.49	1.35	1.22	1.12	1.06	9.1	8.8
Averages	.82	.94	1.05	1.18	1.38	1.29	1.12	1.01	.89	—	—
Departures	+.07	+.08	+.08	+.05	-.02	+.11	+.10	+.08	+.08	—	—
TACUBAYA, D. F., MEXICO											
	Air mass										
	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
										Mb.	Mb.
	NO DATA DURING AUGUST 1951										

*Extrapolated

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

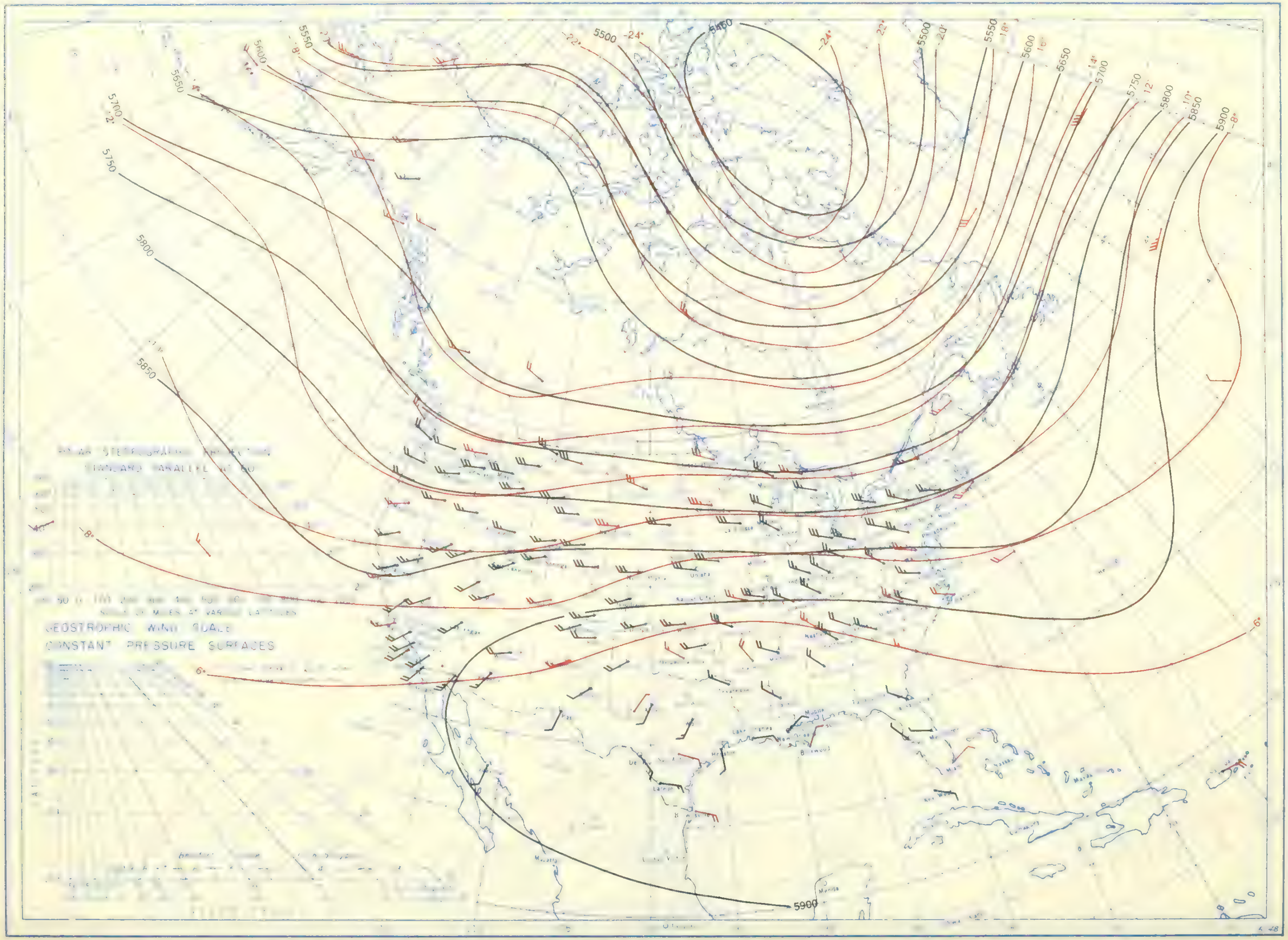
1951	Aklavik, MacKenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismarck, N. Dak.	Blue Hill, Mass.	Boston, Mass.	Brownsville, Tex.	Canton Is.,Pac.Area	Caribou, Me.
July 30	292	624		423	---	252	515	771	594	391	397	---	---
July 31	401	597		651	---	522	(454)	578	453	512	724	---	235
August 1	430	431		669	628	427	353	642	133	155	299	---	(270)
August 2	288	693		618	666	192	123	709	698	659	521	---	(698)
August 3	415	373		609	635	454	(230)	740	361	350	705	---	146
August 4	351	468		371	631	496	227	281	708	659	732	---	---
August 5	533	590		360	496	199	193	175	473	397	582	---	751
Averages	387	539		529	611	363	(299)	556	489	446	566	---	---
Departures		-89		-9	---	---	+20	-37	+4	+28	-100	---	---
August 6	378	675		455	506	395	147	645	651	573	675	---	(728)
August 7	463	629		526	542	386	(461)	546	509	463	710	---	(570)
August 8	386	747		497	215	372	216	604	48	67	744	---	561
August 9	503	742		362	573	453	136	514	490	582	744	---	303
August 10	556	654		342	337	389	111	(462)	295	344	747	(704)	439
August 11	395	729		639	589	309	118	660	333	434	(759)	634	(606)
August 12	547	722		609	597	237	42	90	430	437	721	---	469
Averages	461	700		490	480	363	(176)	503	394	414	(728)	---	(525)
Departures		+50		-51	---	---	-95	-36	-89	-14	+61	---	+9
August 13	280	742		610	587	194	222	250	339	461	636	596	680
August 14	222	717		244	487	214	224	295	537	564	730	(651)	(478)
August 15	367	657		513	576	81	305	429	241	228	730	706	---
August 16	167	595		392	571	198	247	523	169	190	771	(390)	368
August 17	76	658		657	590	180	273	569	171	161	717	675	96
August 18	228	692		518	540	192	360	569	419	375	416	727	(134)
August 19	321	680		675	630	395	229	623	669	526	528	(739)	(617)
Averages	237	677		516	568	208	266	465	364	358	647	(639)	---
Departures		+22		-34	---	---	+3	-73	-99	-45	+22	---	---
August 20	367	545		639	639	243	144	573	279	247	473	(740)	536
August 21	391	585		659	620	284	(92)	356	146	139	560	(752)	(490)
August 22	206	618		537	586	205	348	619	429	448	147	477	(361)
August 23	176	651		593	---	134	261	607	500	446	413	643	238
August 24	130	661		406	623	168	78	347	396	290	483	(632)	211
August 25	176	532		574	590	218	(66)	612	517	526	633	608	350
August 26	435	427		640	600	216	110	581	454	426	700	764	405
Averages	269	574		578	610	210	(157)	528	388	360	487	(660)	(370)
Departures		-51		+35	---	---	-71	-5	-85	-33	-102	---	-30
August 27	126	442		662	577	79	190	538	517	327	713	---	230
August 28	225	510		607	523	259	127	382	450	406	724	---	214
August 29	365	709		634	502	159	111	109	500	367	704	---	428
August 30	272	667		381	353	203	252	214	499	403	697	---	259
August 31	143	690		582	483	160	168	177	445	407	705	---	165
September 1	225	691		495	574	209	152	409	12	27	685	---	630
September 2	---	685		349	528	164	219	357	30	41	661	---	(460)
Averages	226	627		530	506	176	174	312	351	283	699	---	(341)
Departures		+37		+4	---	---	-56	-183	-49	-72	+100	---	-25
Accumulated Departures January 1 to September 2, 1951		+357		+1869	---	---	-2947	---	+504	+462	---	---	---

1951	Charleston, S. C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.
July 30	393	654	629	595	721	581	555	---	479	699		760		
July 31	507	402	686	582	716	233	535	---	451	714		624		
August 1	578	712	713	692	736	604	175	---	638	655		656		
August 2	518	696	616	620	738	516	679	---	672	319		723		
August 3	(487)	492	(617)	436	751	595	439	---	590	118		694		
August 4	407	751	732	677	748	625	635	---	686	566		669		
August 5	651	615	670	635	744	446	559	---	705	698		678		
Averages	(506)	618	(666)	605	736	514	511	---	603	538		686		
Departures	-41	---	---	---	+78	+75	+44	---	-41	-80		+79		
August 6	616	163	614	139	733	106	669	---	732	756		708		
August 7	609	(332)	304	195	726	148	611	---	709	759		(722)		
August 8	629	648	544	590	699	463	83	---	(707)	761		726		
August 9	640	520	309	371	694	342	339	---	719	618		739		
August 10	588	613	622	474	702	512	468	---	708	721		(691)		
August 11	314	631	414	468	704	457	245	---	697	566		647		
August 12	471	603	621	498	703	428	290	---	728	755		643		
Averages	552	(501)	490	391	709	351	386	---	(714)	705		(697)		
Departures	-20	---	---	---	+62	-70	-69	---	+53	+68		+80		
August 13	661	537	448	547	699	395	425	580	---	693		710		
August 14	225	559	454	546	696	417	500	590	---	729		680		
August 15	(384)	498	388	551	684	163	297	480	730	719		681		
August 16	512	513	638	558	668	270	459	393	719	478		669		
August 17	659	281	574	528	608	237	247	552	677	533		687		
August 18	592	576	679	545	652	338	329	573	---	436		676		
August 19	487	554	437	603	594	422	580	530	---	301		682		
Averages	(503)	503	517	554	657	320	405	528	---	556		683		
Departures	-31	---	+56	---	+46	-91	-41		---	-51		+75		
August 20	538	509	382	503	567	257	395	506	---	648		(707)		
August 21	594	598	395	507	544	522	193	528	---	340		(662)		
August 22	614	518	639	505	629	503	456	370	---	688		534		
August 23	269	665	587	640	616	547	482	538	---	699		653		
August 24	656	564	220	642	630	553	504	515	---	554		568		
August 25	601	613	597	564	623	517	424	354	---	660		636		
August 26	500	305	103	292	646	133	402	259	---	680		655		
Averages	539	539	418	522	608	433	408	439	---	610		(631)		
Departures	+48	---	-19	---	+15	+30	-47		---	+12		+39		
August 27	507	436	343	100	666	184	540	241	---	652		687		
August 28	519	436	375	279	496	361	400	158	(657)	652		(684)		
August 29	495	482	599	451	630	439	497	259	657	591		686		
August 30	657	495	624	528	554	311	460	83	672	556		676		
August 31	602	460	603	455	630	359	457	154	670	669		665		
September 1	364	106	389	371	634	71	55	248	684	664		650		
September 2	390	168	229	414	621	190	73	319	686	619		633		
Averages	505	369	452	371	604	274	354	209	(671)	629		(669)		
Departures	+69	-64	+53	---	+42	-46	-49		+21	+65		+123		
Accumulated Departures January 1 to September 2, 1951	---	---	---	---	-182	-6055	-3787		---	---		---		

1951	Glasgow, Mont.	Grand Junction,Colo	Grand Lake, Colo.	Greensboro, N. C.	Griffin, Ga.	Hatteras, N. C.	Honolulu, T. H.	Indianapolis, Ind.	Inyokern, Calif.	Ithaca, N. Y.	Jeanerette, La.	Keflavik, Iceland	Lake Charles, La.
July 30	723	669	663	587	556	689	687	639		685		---	494
July 31	740	634	(526)	597	499	566	622	414		407		---	434
August 1	616	509	662	473	577	705	682	655		572		(431)	530
August 2	726	494	386	588	665	495	600	586		757		182	585
August 3	697	401	496	449	612	713	626	561		226		609	635
August 4	364	243	559	460	617	512	670	679		616		612	566
August 5	615	753	554	531	435	783	670	683		762		411	639
Averages	640	529	(550)	526	566	637	651	602		575		(449)	555
Departures	+52	---	-11	---	-1	+39	+37	+56		+64		---	-2
August 6	679	645	591	212	462	601	591	175		694		650	480
August 7	704	741	619	523	650	324	550	440		158		631	579
August 8	473	761	505	558	295	623	587	428		456		616	596
August 9	527	722	692	565	695	363	732	233		573		153	618
August 10	601	619	572	484	297	598	715	545		605		383	671
August 11	650	723	604	280	783	598	667	405		634		628	620
August 12	516	740	626	556	660	470	696	557		158		644	621
Averages	593	707	601	454	549	511	648	398		468		529	598
Departures	+18	---	+45	---	-19	-80	+1	-109		-21		---	+32
August 13	474	713	680	547	705	479	541	605		635		374	556
August 14	502	721	682	219	(483)	515	735	580		440		307	522
August 15	566	741	727	482	561	620	698	508		331		379	553
August 16	692	722	713	537	667	702	688	442		327		282	547
August 17	491	547	576	560	641	681	547	530		63		343	593
August 18	674	673	435	436	648	552	677	597		652		312	282
August 19	649	482	478	502	676	372	741	621		524		597	517
Averages	578	657	613	469	(626)	560	661	555		427		356	510
Departures	+33	---	+74	---	+71	-16	+50	+38		-20		---	-46
August 20	667	432	118	551	593	540	682	402		524		407	597
August 21	686	408	339	545	653	654	693	484		335		562	632
August 22	564	490	456	533	626	567	658	559		273		450	475
August 23	542	575	653	491	618	95	714	666		211		347	515
August 24	380	400	340	495	613	683	650	620		554		320	594
August 25	432	664	542	523	579	651	676	528		450		123	612
August 26	468	693	577	499	575	683	725	240		592		283	524
Averages	534	523	432	520	(608)	553	686	500		420		356	564
Departures	+47	---	-77	---	+65	-10	+60	+6		-47		---	+20
August 27	136	467	(582)	154	623	144	714	125		548		204	---
August 28	386	395	(431)	202	599	142	707	341		522		183	---
August 29	231	151	332	433	471	622	677	178		565		161	---
August 30	505	568	510	547	(498)	659	518	542		547		437	---
August 31	354	673	668	529	544	575	635	559		324		439	---
September 1	261	670	673	540	576	626	686	329		40		420	---
September 2	480	673	691	529	539	621	577	139		81		426	---
Averages	336	514	(555)	419	(550)	484	645	316		384		324	---
Departures	-129	---	+53	---	+83	-37	+20	-101		-60		---	---
Accumulated Departures January 1 to September 2, 1951	---	---	+1064	---	---	---	+3556	---		-455		---	+952

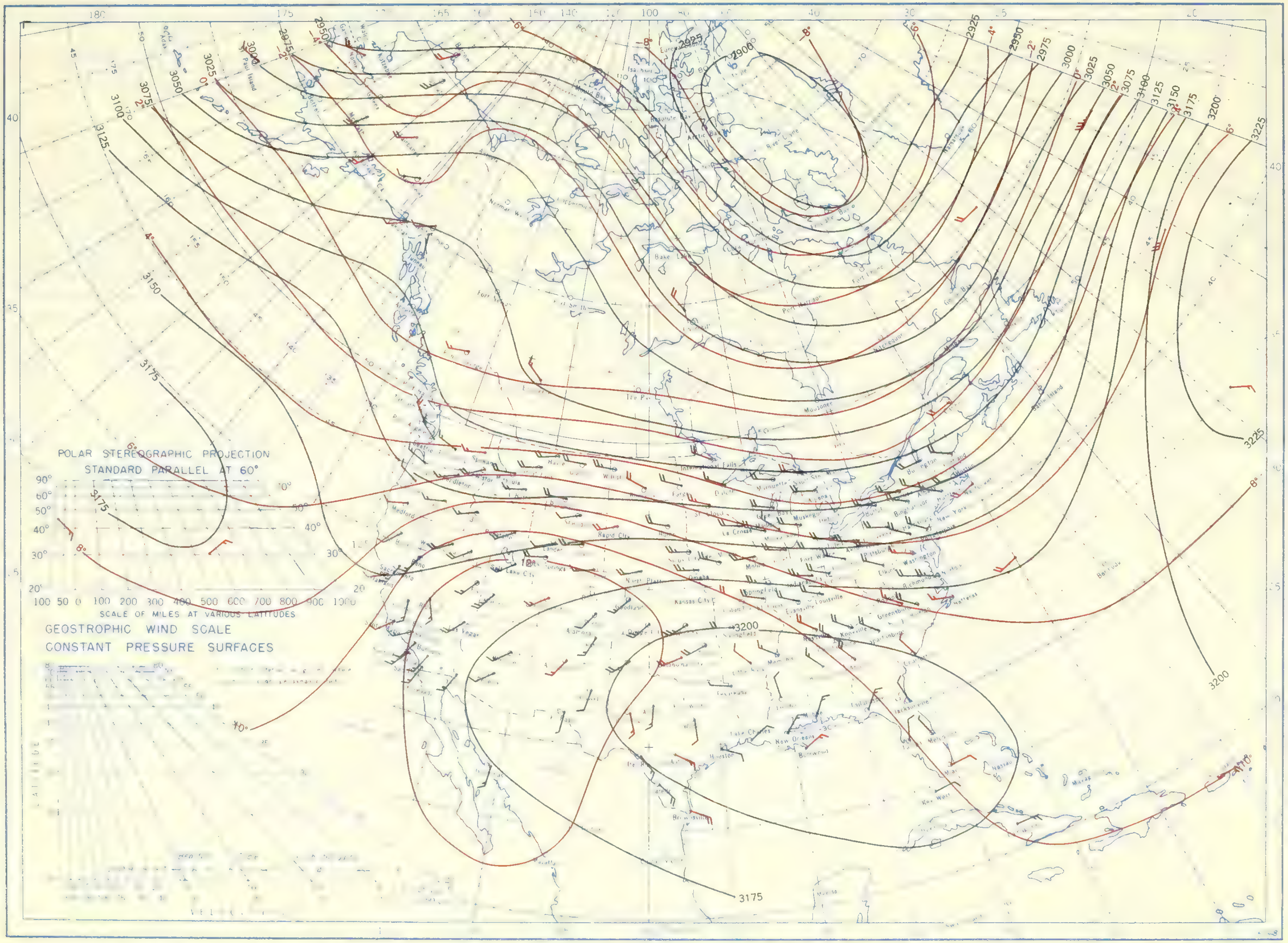
Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), August 1951.



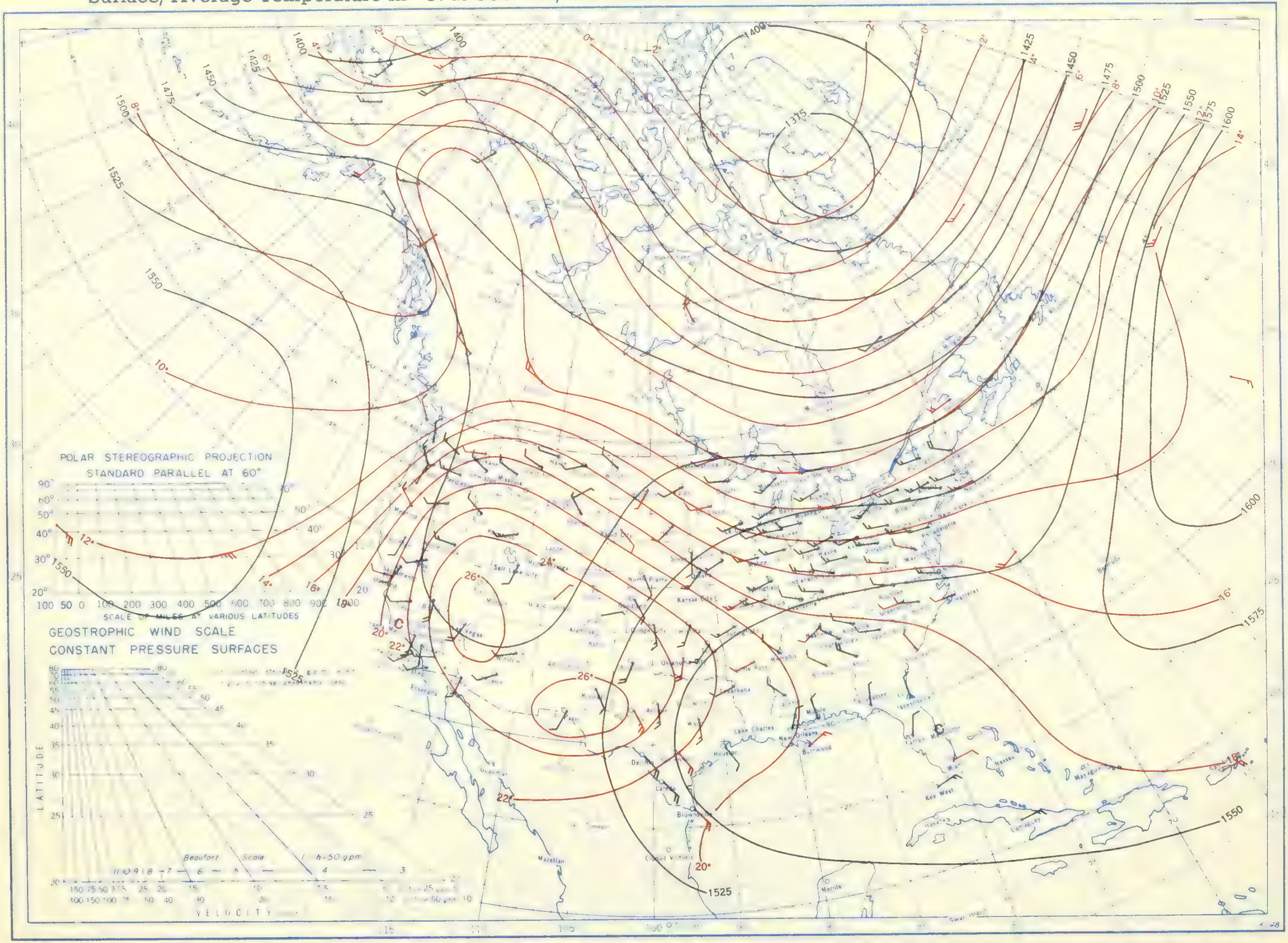
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), August 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

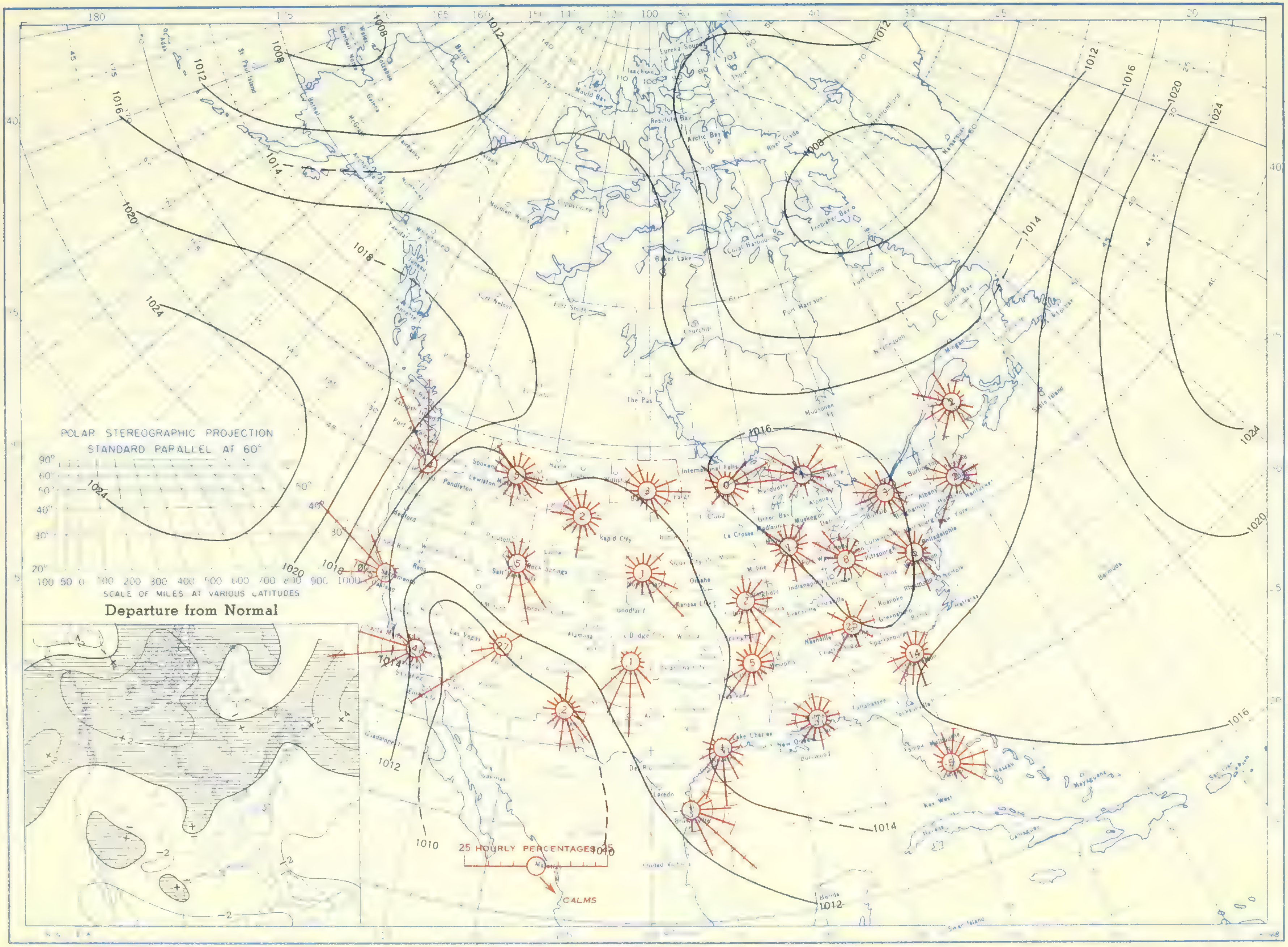
Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), August 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

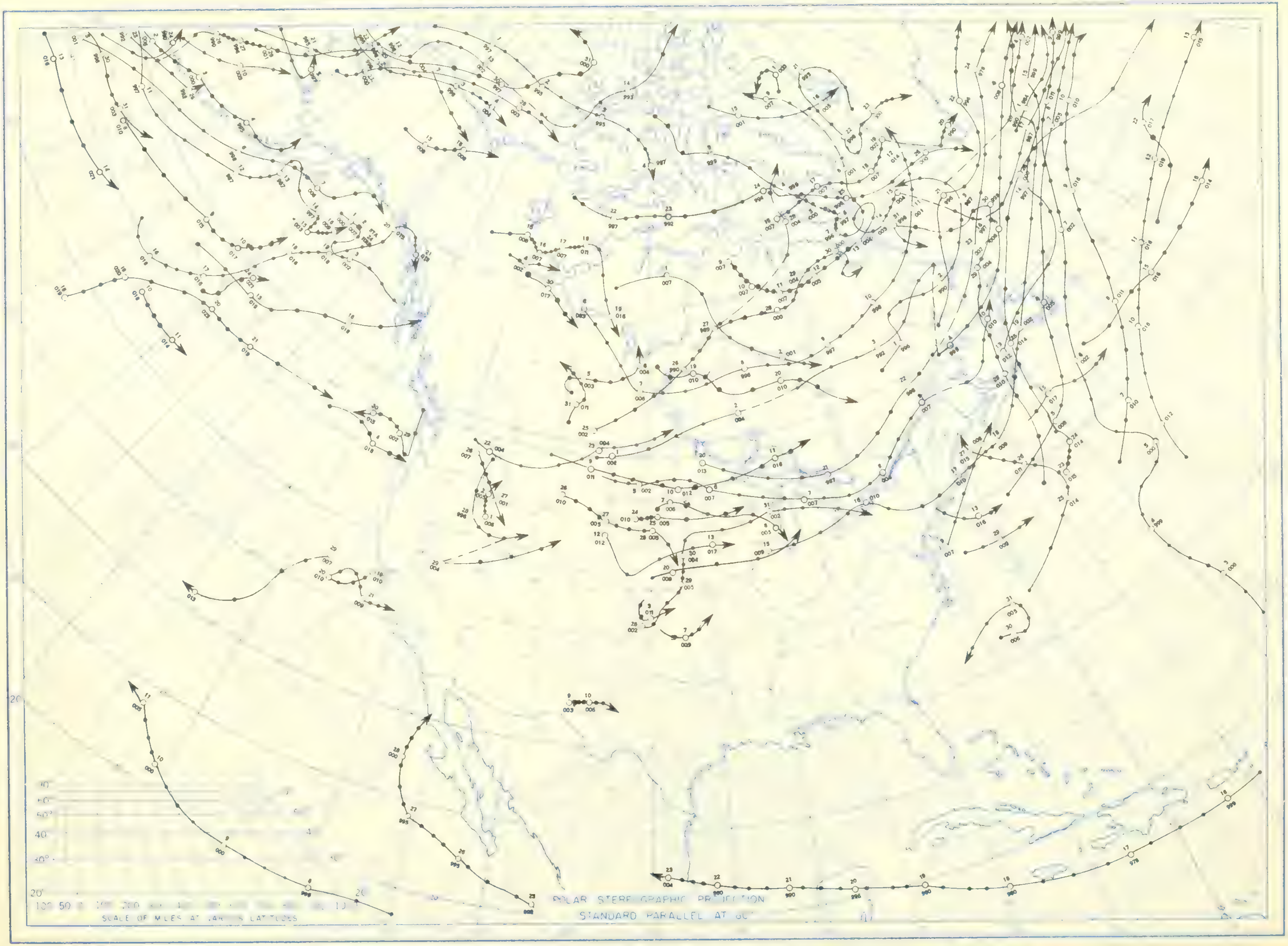
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols

Average Pressure (mb.) from Normal, August 1951.



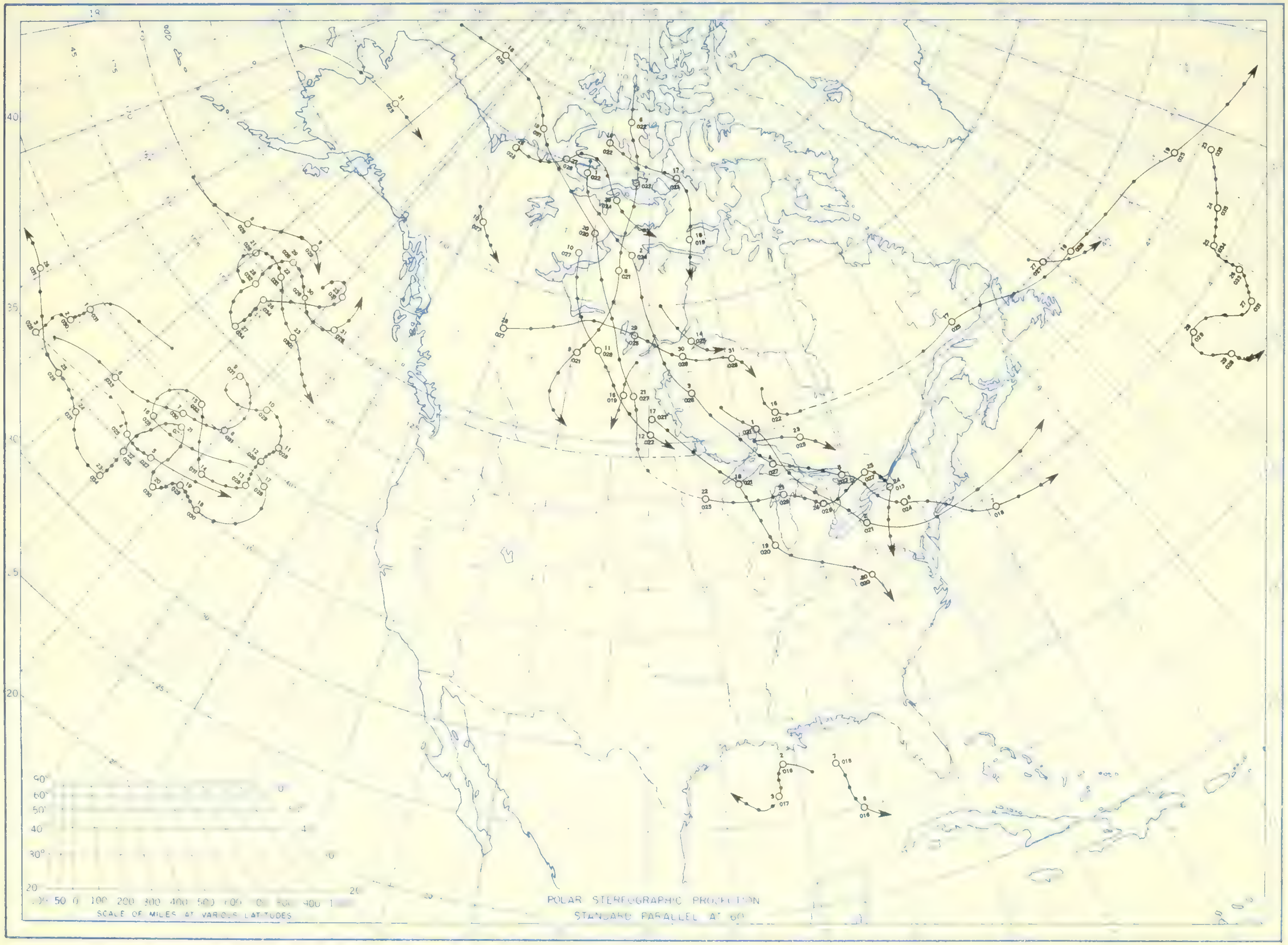
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899-1939.

Chart X. Tracks of Centers of Cyclones at Sea Level, August 1951.


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES

Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, August 1951


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES

Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, August 1951. Inset: Percentage of Normal Average Daily Solar Radiation, August 1951.

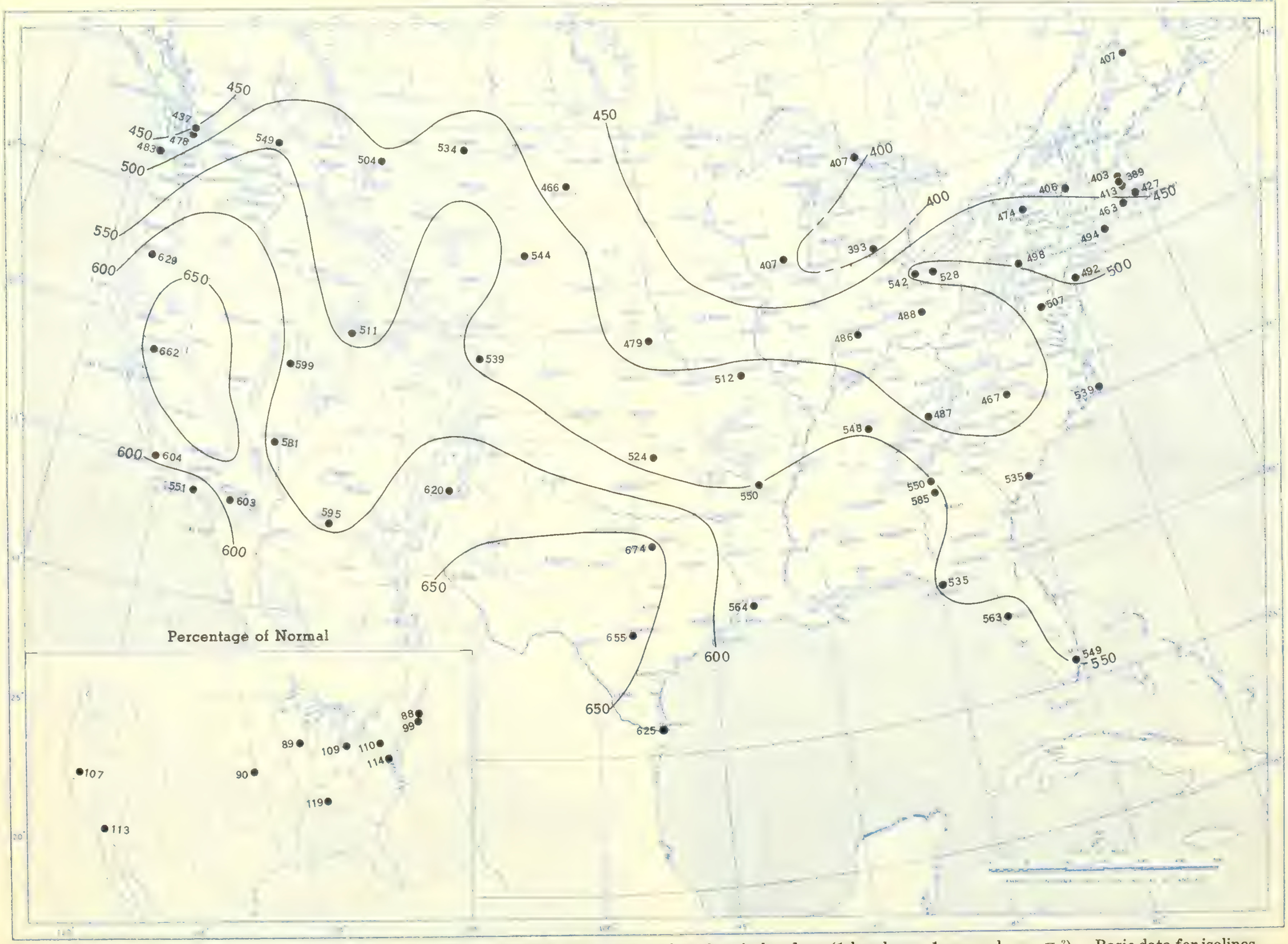
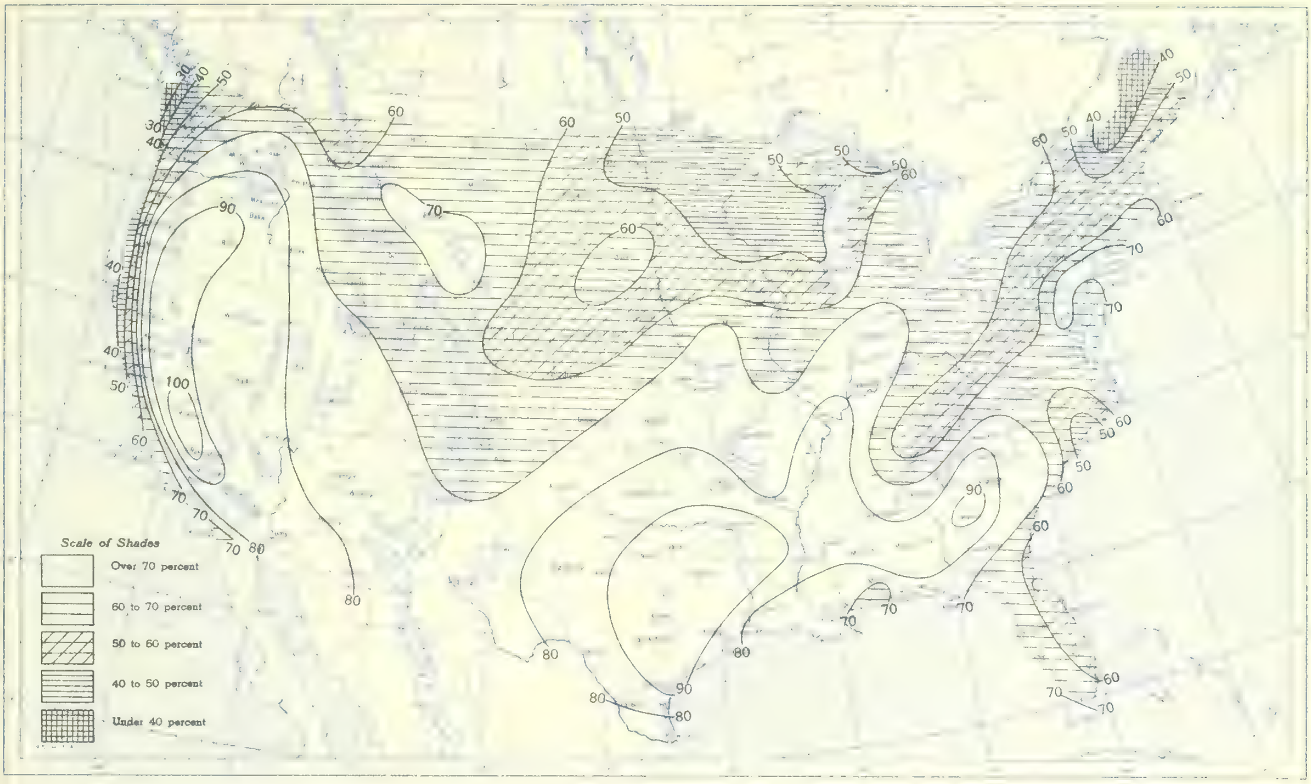
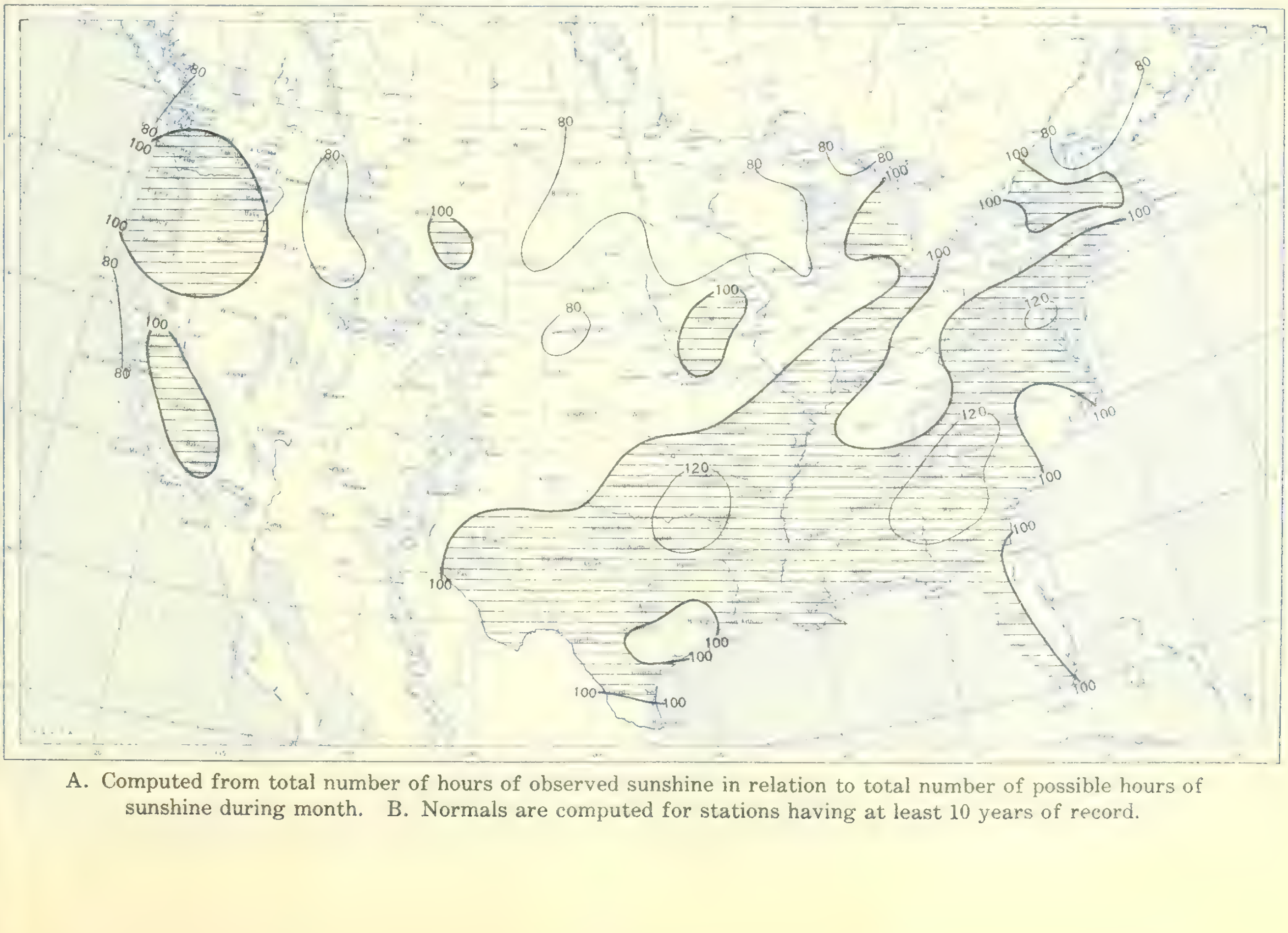


Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart VII. A. Percentage of Possible Sunshine, August 1951.

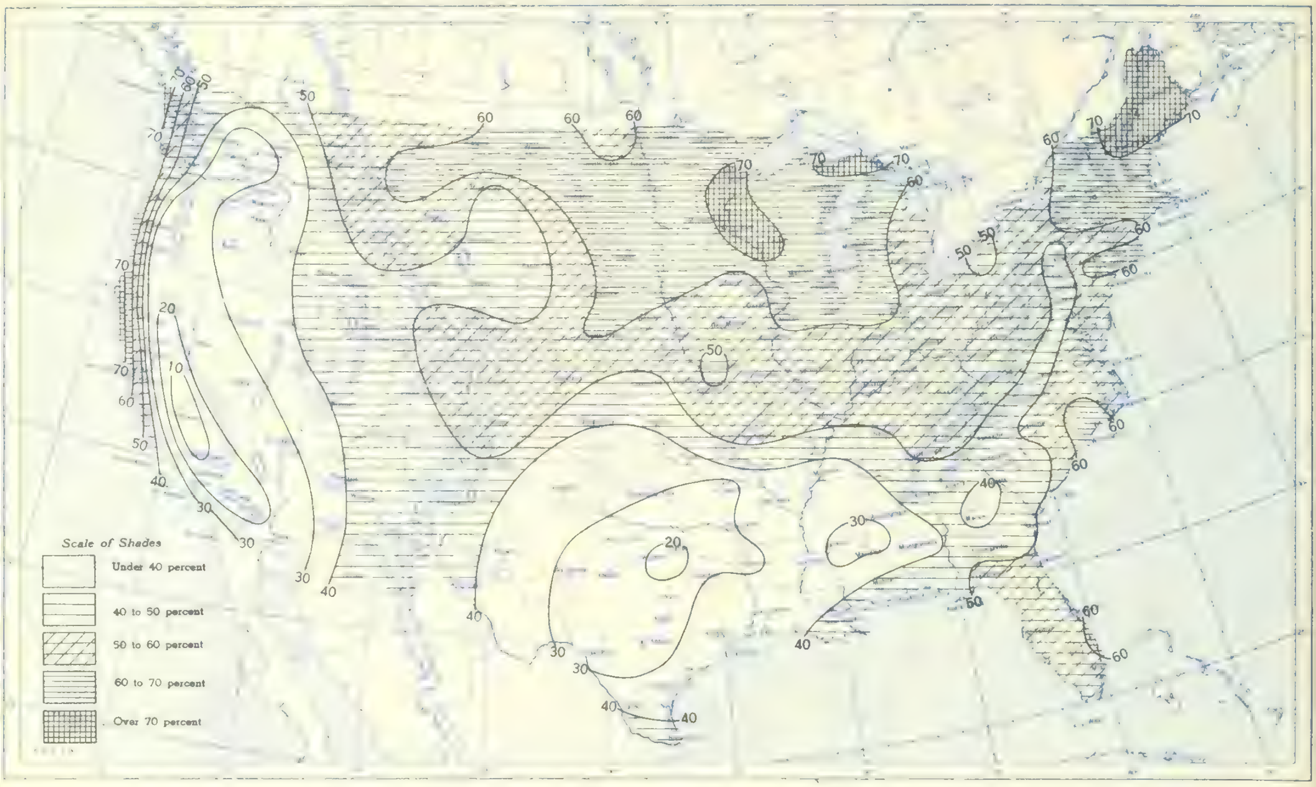


B. Percentage of Normal Sunshine, August 1951.

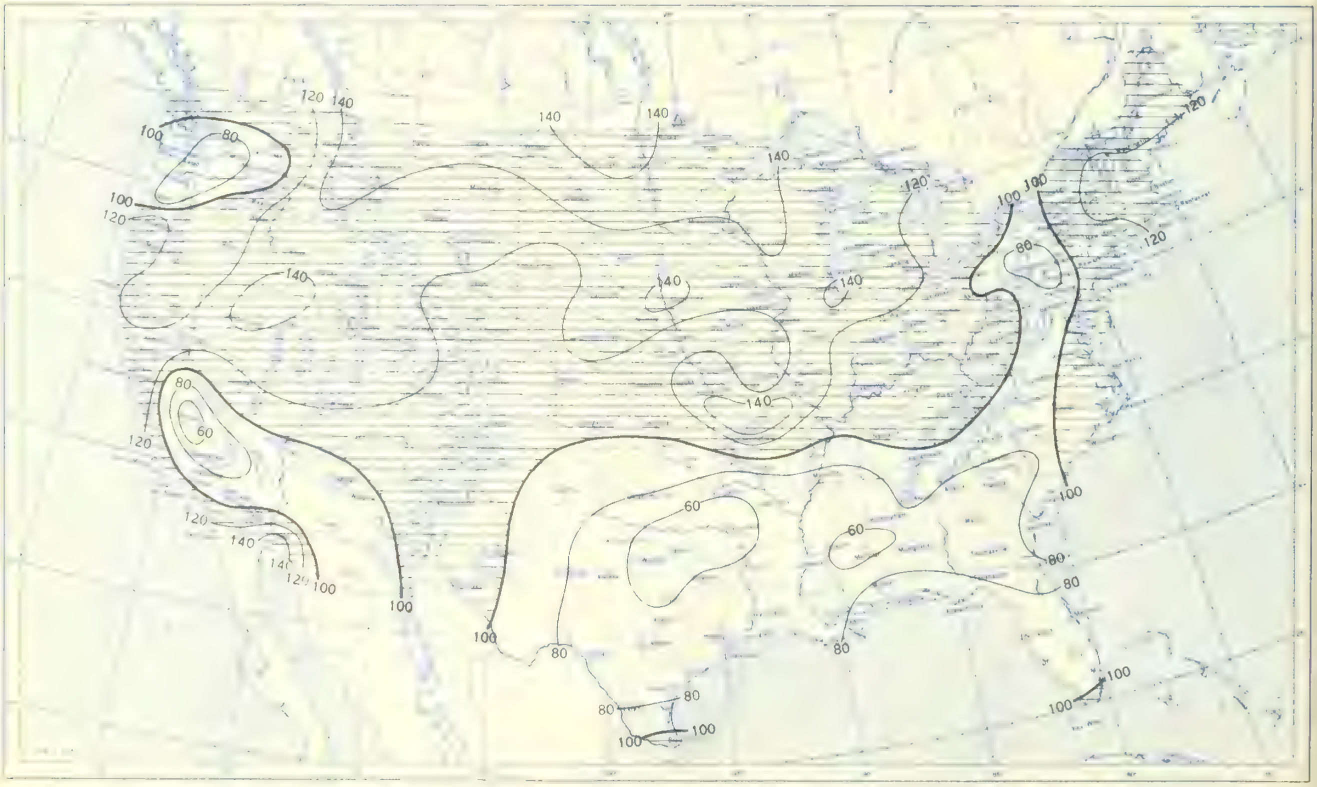


A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, August 1951.

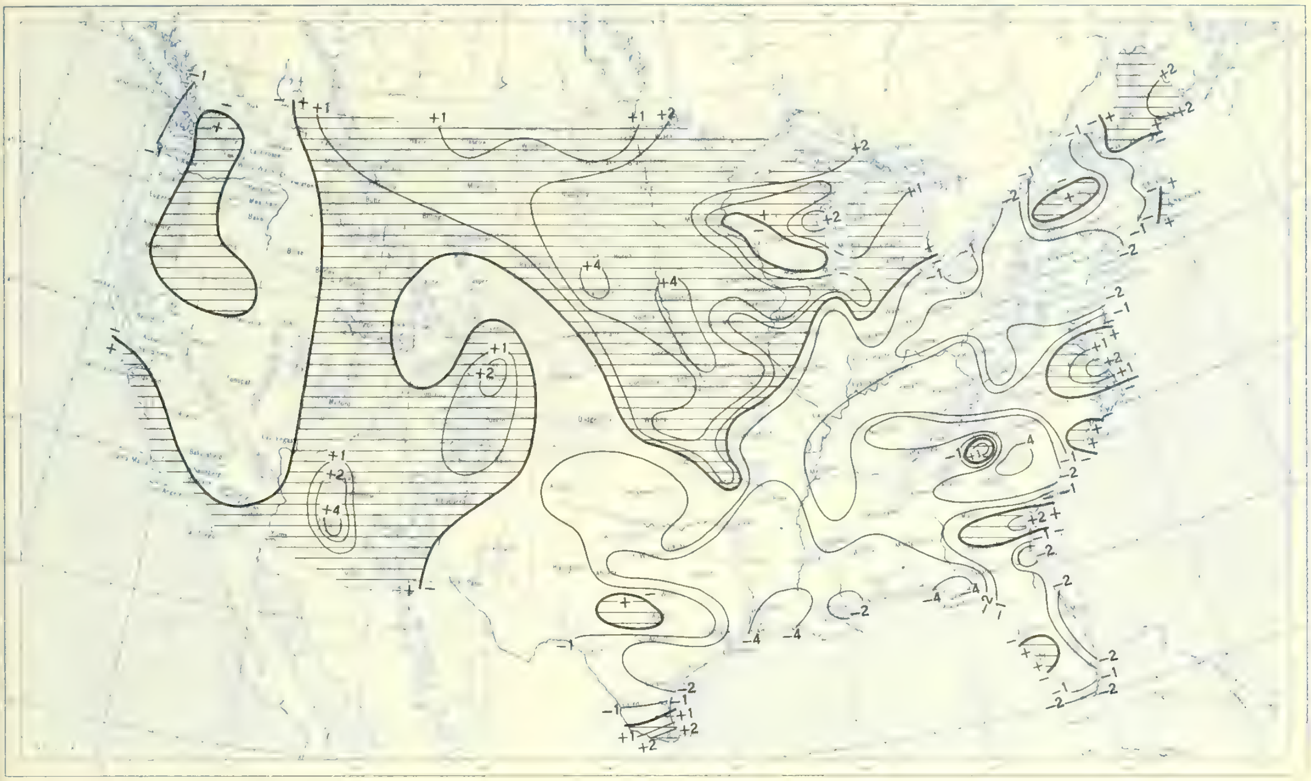


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, August 1951.

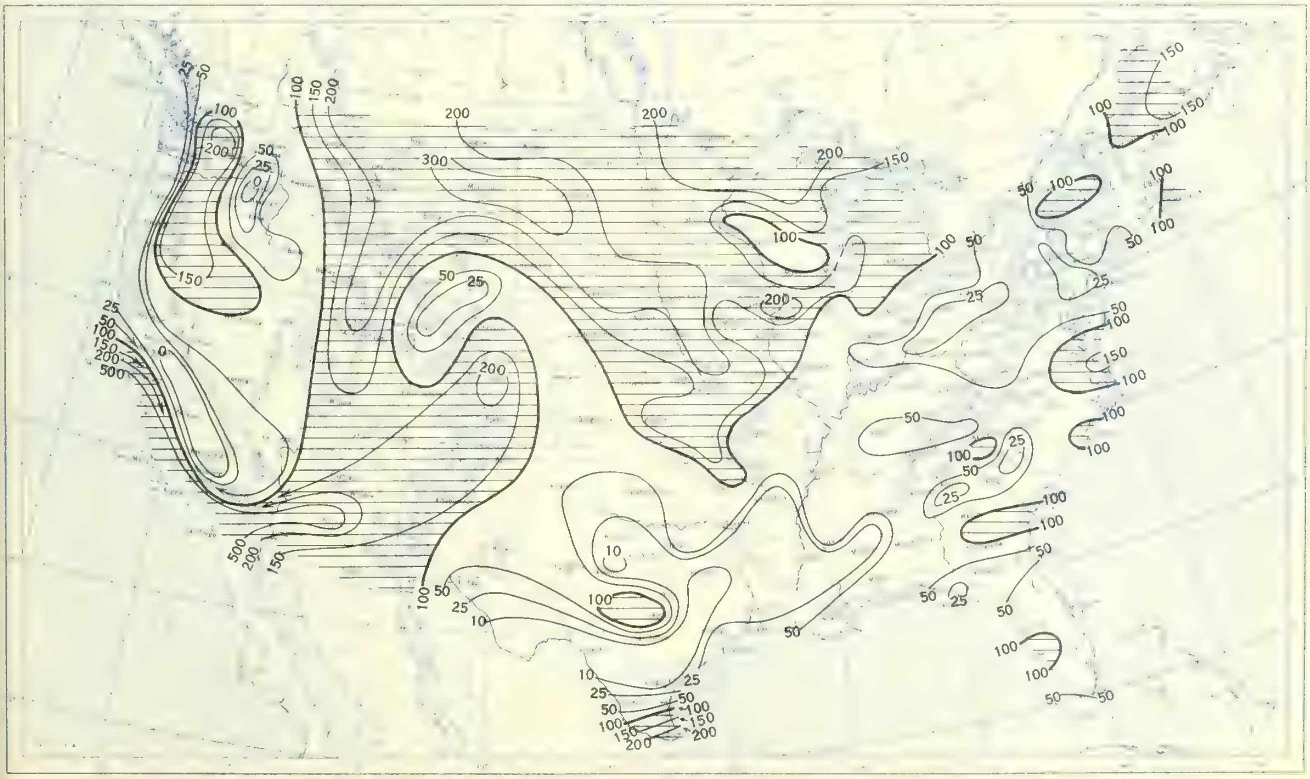


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart III. A. Departure of Precipitation from Normal (Inches), August 1951.

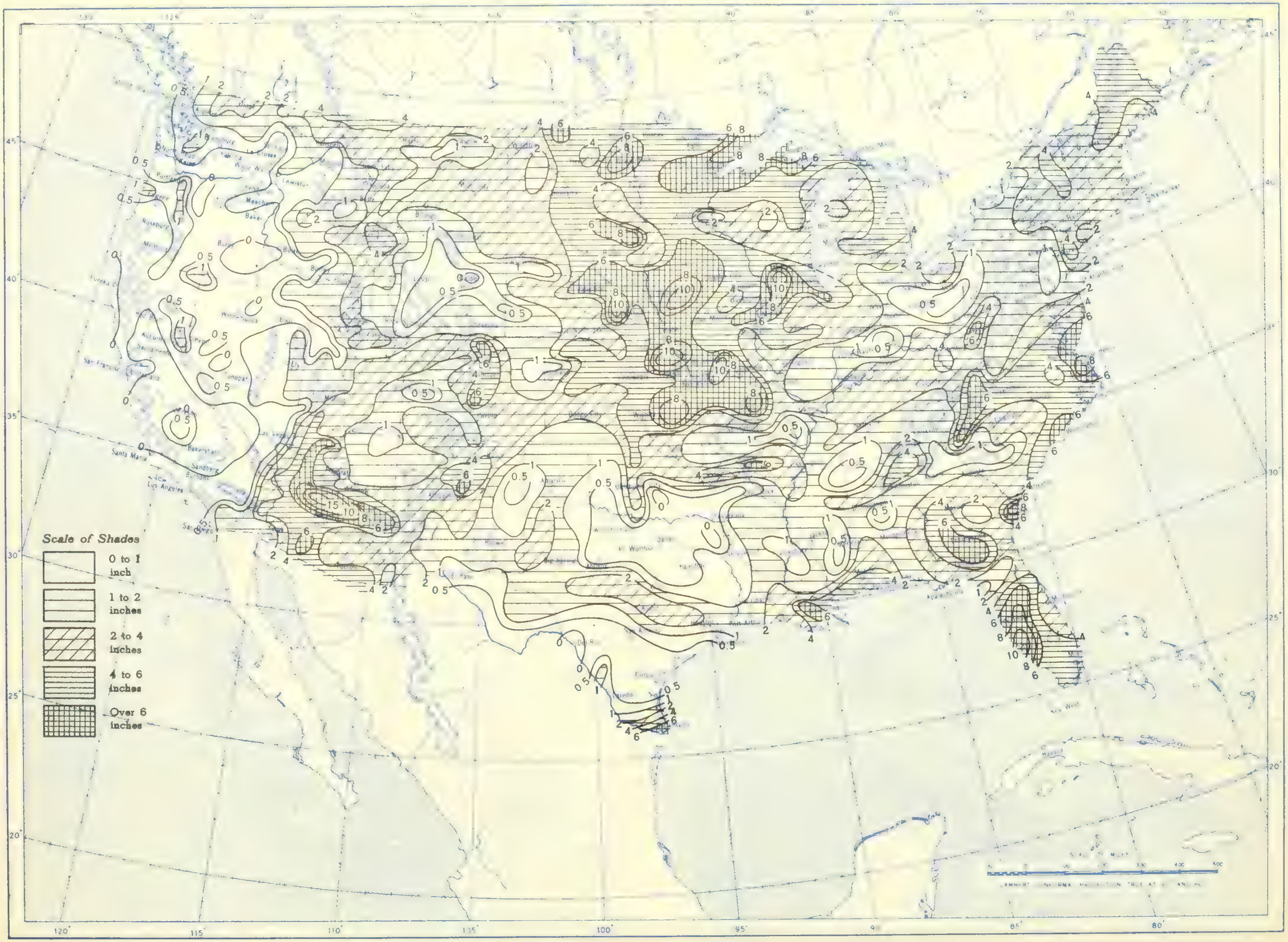


B. Percentage of Normal Precipitation, August 1951.



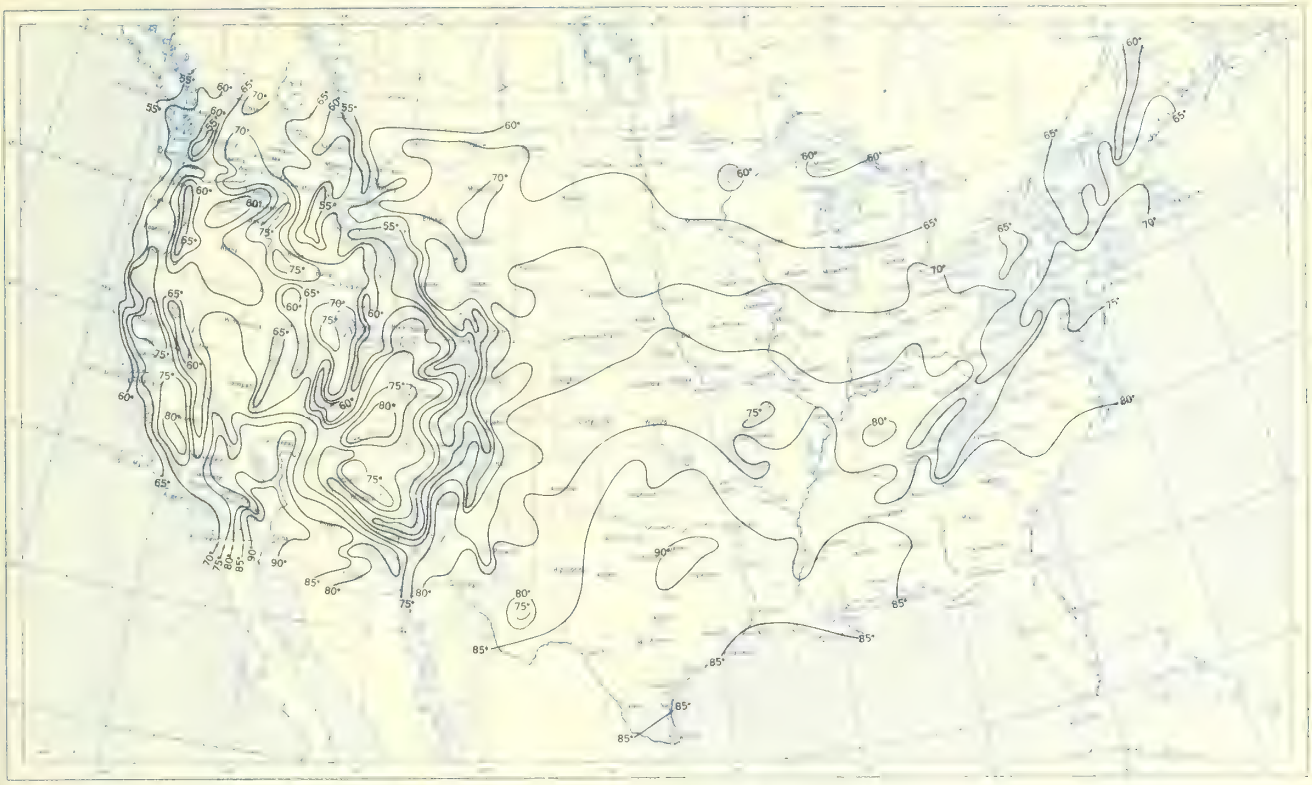
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), August 1951.

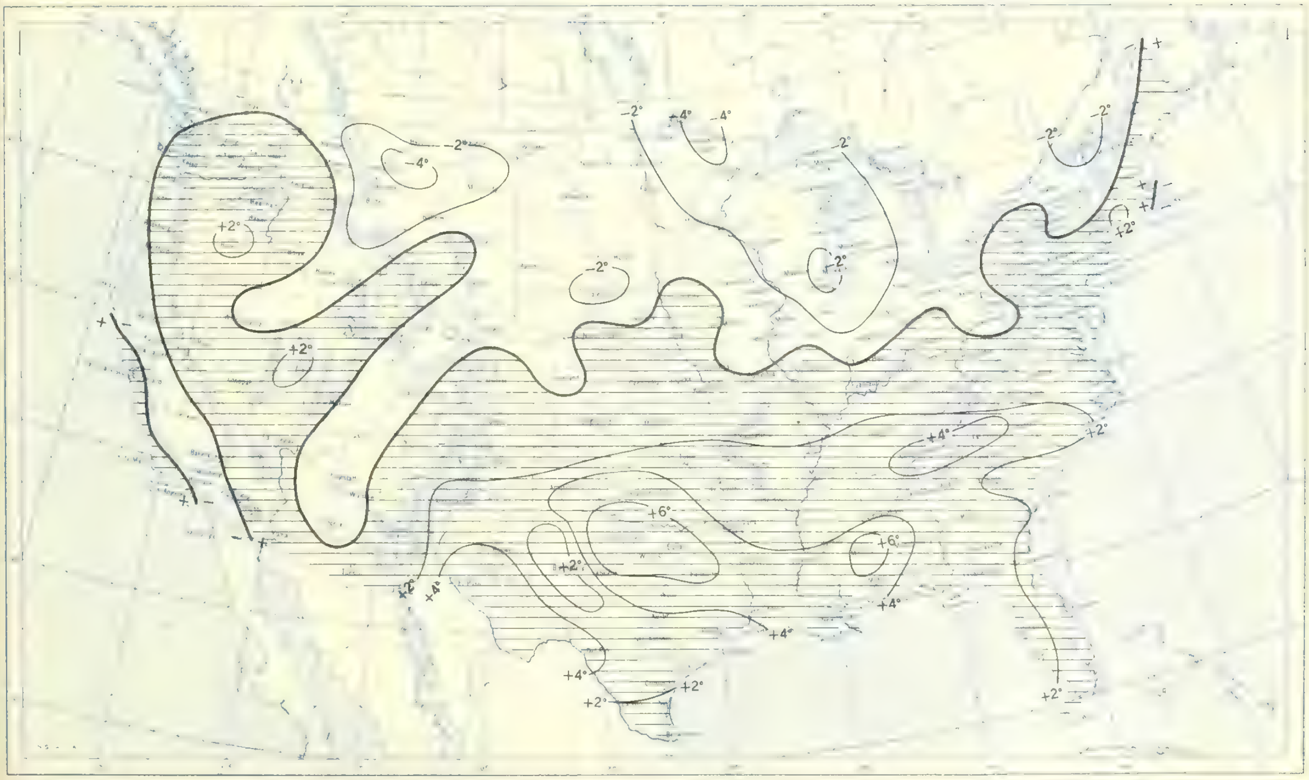


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart I. A. Average Temperature (°F.) at Surface, August 1951.



B. Departure of Average Temperature from Normal (°F.), August 1951.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. – Continued

1951	Las Vegas, Nev.	Lexington, Ky.	Lincoln, Nebr.	Little Rock, Ark.	Lynn, Mass.	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T. H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S. D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle (U. of W.), Wash.	Seattle-Tacoma, Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Thule, Greenland	Toronto, Ont.	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C.	Winnipeg, Manitoba
July 30----	692		613	650	356	375	736	656	681	627		589	690	---	606	688	658	462	649	557	(652)	639	662	283	545	556	528	667	(644)	729	614	---	624		587	(553)		(390)	434
July 31----	601		658	471	476	700	707	392	648	563		297	581	---	448	626	381	525	636	670	620	660	653	534	620	382	615	677	681	712	535	---	615		269	501		(605)	595
August 1----	378		523	424	172	636	708	512	519	241		479	585	---	658	573	703	484	534	581	523	647	586	665	412	456	475	540	523	693	633	---	674		658	(469)		(309)	550
August 2----	194		522	424	701	366	703	656	550	757		352	607	---	616	590	690	622	647	500	346	621	635	188	764	627	719	517	522	656	724	567	648		565	768		702	528
August 3----	181		569	555	335	642	707	511	554	447		452	594	---	631	386	639	700	643	702	205	705	621	612	326	157	218	300	330	633	313	663	695		520	371		(190)	697
August 4----	689		591	541	685	691	689	630	672	742		494	622	---	666	682	749	629	665	658	---	710	630	656	757	608	657	365	456	694	722	617	512		692	739		758	391
August 5----	702		591	686	482	149	715	515	705	673		699	654	---	691	704	527	562	672	15	472	658	724	706	673	542	678	618	692	705	730	618	642		675	735		(758)	149
Averages-------	491		581	536	458	508	709	553	618	579		480	619	---	617	607	621	569	635	526	(470)	663	644	521	585	475	556	526	(550)	689	610	616	630		567	(591)		(530)	478
Departures-----	-118		+52	---	+13	+20	+2	---	+130	+85		+5	+112	---	+45	-27	+80	-54	+69	+5	-76	---	-2	+61	+106	---	+57	+31	---	+52	+129	+93	---		+122	+134		---	
August 6----	714		631	631	660	110	722	507	552	729		373	293	---	742	681	215	678	671	191	631	687	722	133	721	645	595	632	668	687	434	609	631		439	717		388	202
August 7----	698		589	430	571	390	715	475	554	685		331	620	---	452	547	222	694	691	203	579	690	677	128	323	400	105	603	650	575	87	585	654		150	(456)		(259)	432
August 8----	700		471	589	53	499	728	471	486	118		400	174	---	670	704	---	442	672	622	632	703	632	200	179	142	424	497	500	548	531	191	696		362	(292)		(572)	516
August 9----	700		542	605	460	628	733	535	547	332		513	358	---	639	699	537	526	611	551	619	736	631	470	154	356	495	422	369	635	529	275	640		513	189		(595)	586
August 10----	689		477	465	296	608	716	487	533	479		---	516	---	700	720	645	339	599	451	595	609	573	371	543	441	485	188	218	642	449	359	624		---	579		(444)	378
August 11----	695		333	320	458	441	651	602	657	397		---	526	---	711	709	583	675	626	496	522	586	632	189	(369)	576	352	273	333	621	534	569	689		577	427		361	448
August 12----	694		556	635	374	532	726	593	602	228		462	593	---	720	697	570	236	665	283	617	718	663	651	276	158	329	427	469	652	134	608	(628)		448	292		(300)	586
Averages-------	698		514	525	410	458	715	524	562	424		416	440	---	662	680	462	513	648	400	599	676	647	306	(366)	388	398	435	430	623	385	457	(652)		415	(422)		(417)	450
Departures-----	+65		+15	---	-32	-19	+18	---	+88	-66		-55	-40	---	+43	+25	-40	-58	+99	-88	+37	---	-2	-151	-86	---	-92	-48	---	+6	-88	-71	---		-54	-27		---	
August 13----	653		597	527	477	122	714	591	635	438		523	511	---	666	676	636	567	654	142	629	688	697	280	395	572	358	388	518	518	617	615	(539)		416	417		471	630
August 14----	663		538	607	531	123	695	569	673	557		641	543	322	676	660	614	428	647	98	620	682	673	539	485	395	460	302	538	585	577	634	(547)		248	481		573	370
August 15----	611		636	530	258	181	688	613	590	339		456	531	425	670	645	424	613	632	284	614	681	641	333	376	392	511	557	596	562	535	608	(621)		103	466		529	68
August 16----	543		549	272	223	483	675	656	463	407		671	444	77	644	671	498	593	670	319	608	668	595	675	347	214	570	570	622	648	462	606	(538)		118	376		616	483
August 17----	650		508	597	144	594	658	714	646	296		675	651	290	390	665	425	653	636	450	579	682	621	496	419	373	493	574	635	661	438	558	679		456	341		518	620
August 18----	662		581	568	402	341	501	636	358	548		591	361	630	658	647	584	667	643	337	490	634	663	575	610	314	606	600	640	619	600	410	566		569	657		(503)	423
August 19----	332		481	552	545	179	616	579	648	674		657	545	572	623	658	622	337	644	631	553	426	626	331	652	503	483	540	552	585	495	583	65		452	679		596	584
Averages-------	588		556	522	369	289	650	622	573	466		602	512	386	618	660	544	551	647	323	585	637	645	461	469	395	497	505	584	597	532	573	(507)		337	488		(544)	454
Departures-----	-43		+67	---	-78	-169	-4	---	+145	+10		+164	+49		+62	-3	+52	+4	+102	-149	-24	---	+2	-8	+5	---	+17	+36	---	+16	+97	+54	---		-78	+27		---	
August 20----	527		347	597	271	138	517	635	628	497		628	644	593	642	528	437	615	649	226	394	666	585	454	446	394	532	490	544	625	529	597	(540)		485	(455)		565	504
August 21----	568		584	438	118	600	520	500	474	203		---	532	146	692	582	630	664	650	---	312	629	578	107	285	97	445	571	588	620	363	261	656		(375)	314		524	629
August 22----	648		344	407	463	633	425	440	516	489		575	501	168	632	667	586	439	637	---	516	643	618	663	553	347	542	425	507	408	476	260	672		454	595		(561)	600
August 23----	662		262	575	456	597	624	252	672	596		---	(628)	640	630	632	663	583	644	---	531	604	595	641	577	374	597	484	520	633	573	220	671		609	625		650	279
August 24----	630		265	630	356	565	642	324	618	374		278	500	407	656	670	682	532	653	---	531	623	611	627	573	433	453	465	535	379	549	576	690		584	630		620	90
August 25----	637		429	638	395	394	633	590	480	535		280	579	601	640	667	639	632	637	---	616	644	588	632	295	481	532	384	381	575	498	565	619		552	(441)		612	276
August 26----	627		410	609	393	341	632	494	420	384		321	306	600	601	470	195	629	623	---	517	671	583	47	(469)	559	503	384	382	528	571	359	668		416	505		637	462
Averages-------	616		377	556	350	467	570	462	544	440		416	(527)	451	642	602	547	585	642	---	488	650	594	453	(457)	384	515	458	494	538	508	406	(645)		(496)	(509)		(596)	406
Departures-----	+16		-95	---	-73	+16	-31	---	+85	-24		-2	+80		+79	-24	+38	+25	+110	---	-43	---	-18	+3	+11	---	+46	+9	---	-5	+57	-98	---		+63	+57		---	
August 27----	524		456	643	439	339	558	660	298	615		216	406	504	649	60	482	627	617	---	480	663	522	156	505	440	532	154	251	395	446	586	674		189	(419)		(275)	476
August 28----	217		476	665	397	412	323	666	390	455		417	215	512	640	309	590	367	172	---	492	668	542	(224)	587	348	446	179	137	107	395	563	414		422	(456)		(150)	448
August 29----	598		354	660	468	205	333	462	405	529		557	210	442	606	226	556	450	173	---	334	660	129	308	524	451	570	308	422	143	550	568	623		443	(373)		(579)	225
August 30----	618		536	670	496	316	620	571	553	564		466	461	394	475	664	552	556	483	---	377	623	542	387	536	448	532	310	260	261	491	576	509		413	534		558	82
August 31----	605		115	---	401	361	609	584	583	519		538	397	40	518	668	369	323	545	---	408	666	598	162	545	357	561	464	467	431	454	569	(630)		(232)	523		551	431
September 1----	598		310	---	45	104	594	567	513	50		238	508	655	625	673	91	386	626	---	411	660	615	626	127	48	463	338	321	520	259	599	(625)		300	135		500	196
September 2----	586		157	562	49	117	603	325	455	120		---	454	78	429	668	424	370	622	---	561	639	528	504	128	56	279	348	311	575	228	532	(601)		119	132		260	550
Averages-------	535		343	640	328	265	520	548	457	408		405	379	375	563	467	438	440	463	---	438	654	497	(338)	422	307	483	300	310	347	403	571	(582)		(303)	(367)		411	344
Departures-----	-38		-101	---	-68	-147	-27	---	+9	-8		-24	-35		-12	-119	+6	-56	-40	---	-64	---	-54	-92	+14	---	+29	-139	---	-168	-20	+82	---		-53	-47		---	

Accumulated Departures January 1 to September 2, 1951

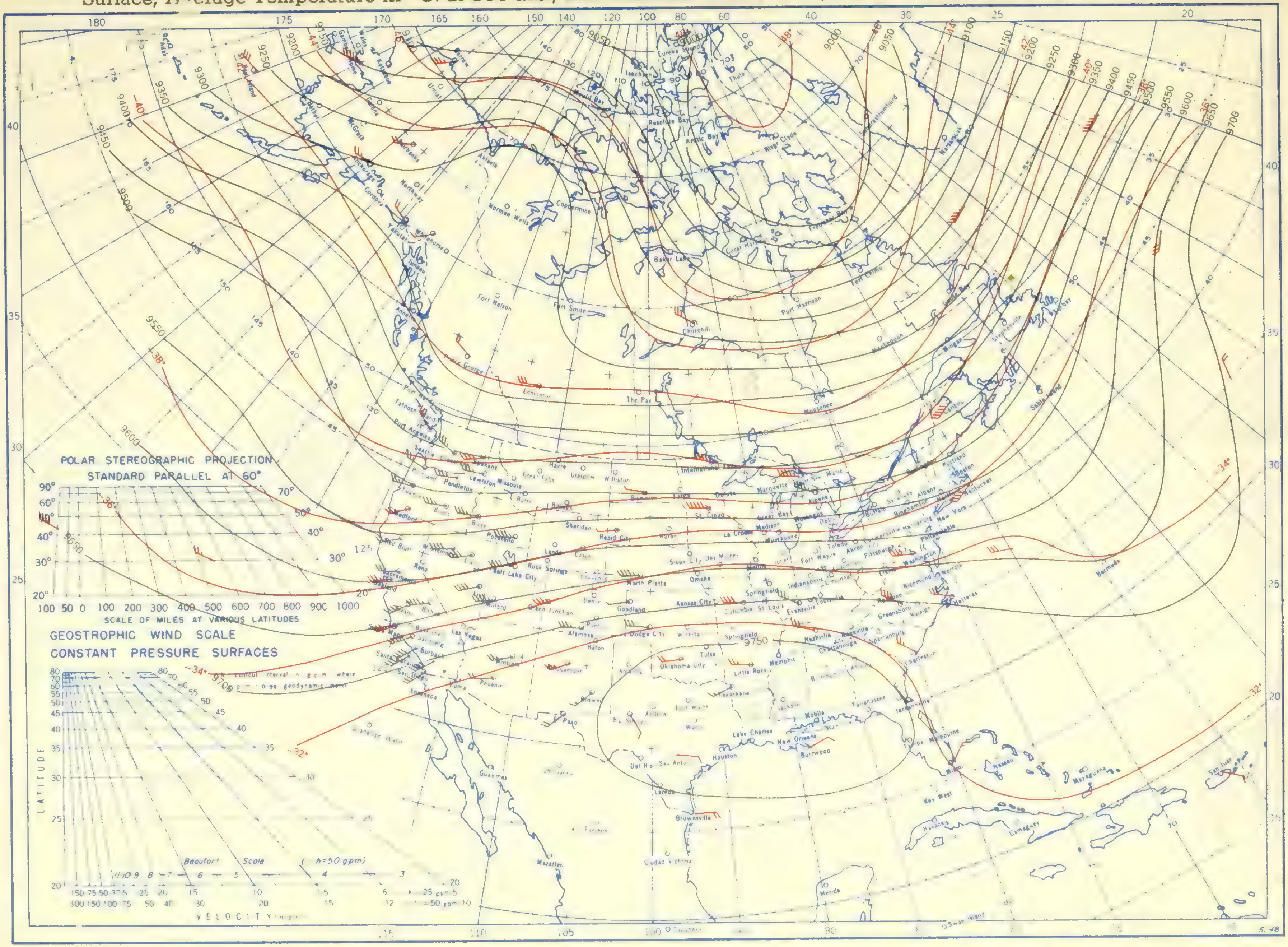
	Las Vegas, Nev.	Lexington, Ky.	Lincoln, Nebr.	Little Rock, Ark.	Lynn, Mass.	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T. H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S. D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle (U. of W.), Wash.	Seattle-Tacoma, Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Thule, Greenland	Toronto, Ont.	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C.	Winnipeg, Manitoba
	-1946		-6755	---	---	-5726	+2008	---	+5159	+763		---	+1761		+5971	---	---	---	+4662	---	-609	---	-2079	---	-161	---	+882	---	---	-329	+1036	---	---		-1582	+2807		---	

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

Beginning with this issue a new station is being included in Table 33. A brief description of the station follows:

Seattle-Tacoma, Washington: Latitude 47° 27'N; longitude 122° 18'W; elevation 142 meters. Exposure is excellent. There is some smoke, but seldom is visibility reduced to less than 5 miles. Equipment consists of an Eppley pyrheliometer and Brown potentiometer. This is a Weather Bureau station, located at the W. B. Office, Seattle-Tacoma Airport.

Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), August 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

SEPTEMBER 1951
Volume 2 No. 9

NEW ORLEANS: 1951

CONTENTS

SURFACE DATA Page

General Summary of Weather Conditions---------------------- 281

Condensed Climatological Data - States-------------------- 282

Climatological Data - Stations----------------------------- 283

Heating Degree Days-- 288

Severe Storms-- 289

General Summary of River and Flood Conditions------------- 295

Flood Stage Data--- 296

UPPER AIR DATA

Radiosonde Data-- 297

Pilot Balloon Data--- 300

Rawin Data--- 301

SOLAR RADIATION DATA

Solar Radiation Intensities-------------------------------- 302

Blue Hill Data--- 303

Daily Totals and Average Daily Totals by Weeks------------ 304

CHARTS I-XV

NOTE.—This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 9

SEPTEMBER 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

On a Nation-wide basis September was cooler and slightly wetter than normal. In north-central areas below-normal temperatures, frequent precipitation, and lack of sunshine were unfavorable for the maturity and harvest of the major agricultural crops. The month brought relief from the severe drought in the Northwest and from intense heat and drought in the South. In most areas there were no unusual extremes of temperature or precipitation. Killing frosts were a little earlier than usual in some northern areas.

In extreme north-central areas snowfall was unseasonably early and heavy.

Storm frequency and damage were less than usual. Sunshine was above normal in the far West and Northeast, but below in north-central and southeastern areas. No serious floods occurred, and stream flow in south and southeastern streams was extremely low.

The average temperature for the United States was 65.2°, 0.8° below the long-term mean, but slightly higher than the averages for September 1949 and 1950. Between the Continental Divide and the Appalachians and as far south as Colorado, northern Oklahoma, Arkansas, and northern Tennessee monthly average temperatures were below normal. The greatest minus departures occurred in the central and northern Great Plains and ranged from 3° to over 5°. Elsewhere monthly averages were slightly above normal, except much above in an area extending from south-central Oregon through Nevada, eastern California and extreme western Arizona where plus departures ranged from 4° to over 5°. This was the coldest September in Minnesota since 1918 and the coldest in North Dakota since 1934.

Frequent cold air invasions kept temperatures below normal most of the time in north-central areas and on three different occasions surged deep into southern areas. The first of these caused below-normal temperatures in the northeast quarter of the country the last 2 or 3 days of the first decade. The second occurred about the middle of the month and brought a period of below-normal temperatures between the Rocky Mountains and Appalachians from the Northern Border to the Gulf of Mexico, with frost occurring in the western portions of the northern Great Plains as far south as northwestern Kansas and some stations in the western portion of the lower Great Plains recording their lowest minima of the month. During the last week cold air overspread practically the entire country bringing the first general killing frost of the season to most northern sections, and the lowest minima of the month to most sections. The lowest temperature of the month was 4°, recorded at Bondurant, Wyo. on the 27th.

In the southeastern quarter of the country the dry, hot weather of August continued during the first 3 or 4 days of September, and most stations in that section recorded their highest temperatures of the month during this period. A temperature of 110° was recorded in Louisiana on the 1st, one of the highest September temperatures ever recorded in the State. The highest temperature recorded east of the Rocky Mountains was 113° at Holdenville, Okla. on the 2d; this was the highest temperature ever recorded at this station since it began taking observations in 1901. Stations in New England, the upper Mississippi Valley and northern Great Plains, and far western States generally recorded their highest temperatures for the month on various dates during the first half. The month's highest temperature, 115°, occurred in California at Greenland Ranch on the 9th and 15th, Cow Creek on the 9th, 10th, 11th, 15th, and 16th, and at Palm Springs on the 12th. Monthly maxima at most stations generally were well below September records, especially in north-central sections. Nebraska's maximum of 96° was the lowest September maximum recorded in that State since the beginning of state-wide records in 1887. Tucson, Ariz. after recording early-season low temperature records of 65° and 63° on the 1st and 2d, recorded late-season high temperature records of 103° on the 13th and 14th and 104° on the 15th.

The September average total precipitation for the United States was 2.47 inches which was 0.04 inch above the long-term mean. Totals were generally below normal in western Texas, and in the Rocky Mountain and Pacific States. Totals varied from above to below normal in north-central and northeastern areas, but in south-central and southeastern sections totals were generally much above normal. Rockport, Tex. recorded 18.88 inches for the greatest monthly total. No precipitation was recorded at 288 stations in California, mostly in the central and south, and 200 other scattered stations in the far western States and the western portions of Oklahoma and Texas. The greatest 24-hour total was 13.21 inches, measured at Alice, Tex. on the 13th. Twenty-four-hour amounts exceeding 8 inches occurred at stations in Florida and Oklahoma.

The heat and drought conditions that had prevailed in the South during August were broken in some sections during the second week and in nearly all sections before the end of the month. Heavy rains were rather general in the South from the 13th to 17th. East of the Rockies precipitation was generally well distributed through the month, and was unusually frequent in north-central areas. In North Dakota the number of rainy days for the 2-month period, August-September, averaged 23, a new record.

September snowfall was generally limited to the north-central interior. Snow which fell in the Black Hills as early as the second week and again on the 23d each time melted as it fell or soon thereafter. The greatest monthly total in this region was 3 inches. Snowfall in northern North Dakota and Minnesota during the last week totaled from 1 to 5 inches. Monthly totals at mountain stations in western Montana ranged up to 10.5 inches.

The month's severest storm damage exceeded $4,000,000, over half of which was caused by hail

GENERAL SUMMARY OF WEATHER CONDITIONS—Continued

in the 4 states of Nebraska, Colorado, Wyoming, and Montana. A single hailstone caused crop and property damage of $1,500,000 in Colorado Springs and vicinity on the 4th. Tornadoes in Wisconsin on the 12th and 26th caused 7 deaths and 15 injuries, only 1 death and 3 injuries occurring elsewhere as a result of these storms. One of these storms pulled trees 18 inches in diameter out by the roots. The greatest disaster of the month occurred at Montauk Point, N. Y. on the 1st when the boat "Pelican" capsized in a strong northwest wind and 45 persons drowned. One of the biggest hailstones ever reported in Minnesota fell at Sartell on the 5th. The stone measured about 9.5 inches in circumference and weighed about 2 pounds.

Scattered severe thunderstorms caused considerable damage. During one of these at Sanford, Fla. and vicinity on the 28th, 5.02 inches of rain fell in 4 hours and resulted in $100,000 damage. Lightning and flooding resulting from a heavy rain caused $250,000 damage in Montgomery, Ala. on the 24th. A 4-inch rain in an hour at Mt. LaCoute, Tenn. on the 1st sent a 15-foot wall of water down the Mountain Valley trapping a number of tourists. Heavy rains caused flooding at Alice and Falfurrias, Tex. on the 13th and 14th that resulted in 2 deaths, $1,000,000 damage, and left 3,000 persons temporarily homeless.

In the north-central areas cool, wet weather slowed development of crops, especially corn and soybeans. In Iowa, Nebraska, and more northern sections, the late crop and earlier than usual frosts resulted in considerable soft corn. In Iowa only two-thirds of the corn crop was well dented before killing frost. The dampness also caused blight in the potato crop. However, pastures in this region were unusually good and were reflected in the better than average gains of livestock. In the central Great Plains winter wheat seeding was well along in many sections and moisture was ample for germination and growth.

In some southern and eastern areas prolonged dryness of previous months continued during a part of the month or until too late for good rains to materially increase the yields of crops such as corn and soybeans. This was especially true in Ohio. However, harvesting made good progress. In Florida truck and citrus prospects were good. Good rains in most eastern areas by the middle or late in the month permitted soil preparation and seeding to be speeded up.

In far western areas the weather was ideal for harvesting, except in Montana. In the far Northwest more rain was still needed for winter wheat seeding at the end of the month, although some of this work had been done. Rains were still needed in southern Nevada, southern Utah, and in New Mexico at the end of the month.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 SEPTEMBER 1951

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F			°F		In	In.		In.		In.
Alabama	76.4	+0.9	Birmingham WB City	108	1	Saint Bernard	39	29	5.77	+2.41	Fort Morgan	10.81	Belgreen	1.08
Arizona	73.3	+.6	Yuma WB AP	112	17	Maverick	23	27	.53	-.86	Cave Creek	1.96	6 Stations	.00
Arkansas	71.9	-2.2	2 Stations	108	°1	Paragould	37	29	4.61	+1.29	Hopper	10.92	Hampton	1.19
California	71.8	+2.3	3 Stations	115	°9	Boca	21	°6	.12	-.28	Crescent City CAA AP	2.16	288 Stations	.00
Colorado	57.6	-.8	Las Animas 1N	100	11	Fraser	6	16	.79	-.60	Yuma	5.49	Walsh	.00
Connecticut	62.4	-.2	Waterbury	90	12	2 Stations	25	30	2.36	-1.50	Salisbury	5.00	Candlewood Lake	.34
Delaware	67.9	-.6	Georgetown	94	1	do	33	30	2.29	-1.15	Bridgeville	3.92	Del.City Reedy Pt.	.88
Florida	81.1	+.7	5 Stations	100	°4	do	60	29	7.18	+.36	Titusville 2W	16.04	Cape Sable Ranger Sta.	.79
Georgia	76.4	+.6	Louisville	105	4	Blairsville Exp. Sta.	41	29	5.68	+1.84	Flat Top	12.88	Danburg 3NNW	1.20
Idaho	57.8	+.5	2 Stations	99	7	Pierce RS	12	30	.40	-.58	Burke 2NNE	3.15	32 Stations	.00
Illinois	64.0	-3.7	do	96	1	4 Stations	30	°28	3.49	-.15	Chicago Cal. Tr. Wks.	8.26	Bloomington Normal	1.11
Indiana	63.9	-3.4	Brookville	104	1	Plymouth	24	29	2.72	-.56	La Porte	6.71	Waterloo	.75
Iowa	59.8	-4.6	Missouri Valley	90	11	Inwood 2W	21	28	2.52	-1.49	Merrill 5W	6.09	Keosauqua #2	.81
Kansas	65.4	-4.6	2 Stations	101	1	Burr Oak	28	28	5.07	+2.14	Mound City	12.96	Elkhart SCS	.05
Kentucky	67.8	-2.4	St.John Bethlehem AC	103	1	Grayson	30	29	4.31	+1.38	Benham	7.64	Ashland Dam 29	1.95
Louisiana	78.1	+.2	2 Stations	110	1	Colfax	42	19	6.69	+2.77	Vermilion Lock	15.28	Oak Ridge	1.12
Maine	58.2	+.4	Woodland	91	14	Lac Frontier	26	30	2.83	-.75	Machias	4.77	Fort Kent 1SE	1.51
Maryland	67.9	+.4	Tonoloway	98	1	Oakland	23	29	2.51	-.88	Sharptown	7.29	Western Port	.28
Massachusetts	62.6	+.5	2 Stations	90	°1	Birch Hill Dam	20	30	2.37	-1.32	Hoosac Tunnel	4.54	Chatham	.23
Michigan	57.3	-2.7	Grosse Pointe Farms	92	1	2 Stations	22	29	3.63	+.33	Houghton Lk St Forest	6.43	Ann Arbor U.of Mich.	1.16
Minnesota	54.3	-4.2	Winona	89	12	Roseau Power Plant	19	25	3.49	+.67	Stillwater	9.04	Beardsley	.49
Mississippi	76.6	+.8	Leaksville	107	1	Pontotoc	39	29	4.73	+1.59	Van Cleave	16.10	Baldwyn	1.11
Missouri	65.7	-3.6	Wappapello Dam	105	1	Tarkio	28	28	5.29	+1.29	Lamar	12.55	Livonia	.92
Montana	51.8	-3.8	Crow Agency	91	10	Wisdom	13	27	1.54	+.20	Glacier Park	5.40	2 Stations	.00
Nebraska	59.8	-4.7	2 Stations	96	20	2 Stations	19	28	3.34	+1.24	Benkelman	7.61	Oconto 6 SW	1.29
Nevada	64.8	+2.0	Overton	109	16	Fish Creek Ranch	19	22	.20	-.22	Searchlight	1.49	32 Stations	.00
New Hampshire	58.7	+.3	5 Stations	88	°1	3 Stations	23	30	3.52	-.19	Landoff	5.68	New Castle	1.80
New Jersey	65.6	-.3	Paterson	92	1	Layton 3NW	24	30	1.84	-1.86	Split Rock Pond	5.30	Jersey City	.51
New Mexico	67.1	+1.8	Jal	108	1	Eagle Nest	13	16	.28	-1.57	Elida	3.64	32 Stations	.00
New York	59.9	-1.3	Dansville	96	1	2 Stations	20	30	3.25	-.22	Little Falls City Res.	8.10	Fort Schuyler	.67
North Carolina	71.0	+.1	Caroleen	100	3	do	30	30	2.89	-1.17	Letitia	10.86	Enfield	.40
North Dakota	52.7	-4.4	8 Stations	85	°18	4 Stations	17	28	1.71	+.18	Reeder	5.72	Kulm	.19
Ohio	63.9	-1.7	Cincinnati Lunken AP	100	1	Fredeickstown Sew.Pl.	26	29	3.04	+.10	Cambridge State Hosp.	5.34	Germentown 3NE	1.14
Oklahoma	72.9	-1.3	Holdenville	113	2	Kenton	32	16	4.06	+.91	Herd	16.43	Kenton	.00
Oregon	60.5	+1.8	Oakridge RS	104	14	Fremont	10	26	.98	-.21	Valsetz	8.14	10 Stations	.00
Pennsylvania	63.0	-1.0	3 Stations	96	1	2 Stations	23	°29	2.69	-.70	Lebanon 3SW	8.17	Chester	.70
Rhode Island	65.0	+1.7	Providence WB AP	87	12	Providence WB AP	32	30	1.57	-1.76	Austin	3.27	Block Island WB AP	1.28
South Carolina	74.1	-.5	2 Stations	100	°4	Caesars Head	44	29	4.70	+.64	Myrtle Beach CAA AP	13.74	Bamberg	1.15
South Dakota	55.7	-5.9	Van Metre	92	30	La Delle 7N	14	28	1.71	+.16	Winner	5.73	Rockham	.10
Tennessee	70.7	-.7	Lynnville 4SW	105	1	2 Stations	35	29	4.38	+1.19	Mount Le Conte	8.96	Smyrna 4NE	1.52
Texas	77.6	+1.3	Henrietta	112	2	Dalhart Exp. Sta.	34	16	3.44	+.55	Rockport	18.88	7 Stations	.00
Utah	62.0	+1.1	3 Stations	101	°7	Soldier Summit	18	22	.28	-.76	Gunlock PH	1.30	14 Stations	.00
Vermont	58.1	.0	Enosburg Falls	90	13	West Burke	20	27	3.39	-.32	Saint Albans	5.45	Union Village Dam	1.95
Virginia	68.4	-.1	Danville	99	2	3 Stations	29	29	1.89	-1.36	Olinger	8.06	Altavista	.34
Washington	60.0	+1.1	Kosmos	98	15	Bumping Lake	21	26	1.67	+.03	Aberdeen 20 NNE	10.28	Moses Lake 2E	.05
West Virginia	61.8	-1.4	3 Stations	97	1	Canaan Valley	20	29	3.17	+.15	Richwood	5.85	Petersburg WB City	.90
Wisconsin	56.2	-3.7	2 Stations	89	°11	Brule Island	21	29	3.79	+.07	Mellen	7.23	Cuba City	1.32
Wyoming	52.9	-1.9	3 Stations	90	10	Bondurant	4	27	1.00	-.20	Gillette	4.05	2 Stations	T
Alaska (July)	55.0	+1.1	2 Stations	92	°5	2 Stations	29	°2	2.07	-.25	Yakutat WB AP	5.94	Moose Valley	T
Hawaii (August)	74.8	-.4	Puunene AP	98	19	Haleakala RS	38	27	6.46	+.22	Kukui	44.00	Hukipo	.00
Puerto Rico	78.6	+.3	Coloso (2)	97	°1	Maricao Fisheries	54	°2	10.09	+1.61	Guineo Reservoir	21.34	Mona Island	2.40

° Other dates also.

CLIMATOLOGICAL DATA

Table 2

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max depth on ground	Average hourly speed	Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F	°F	°F.	°F	°F.		°F.				°F	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
ALABAMA																																	
Birmingham	610	992.6	1017.3	86	65	75.4	+2.2	100	1	48	29	7	0	65	79	9.74	+6.36	3.02	11	8	T	T	7.8	SSE	50	SE	21	11	7	12	5.6	65	2
Mobile CO	10	------	------	87	71	78.8	+.7	96	3	61	29	9	0	-	-	9.98	+4.98	2.15	14	12	.0	0	8.1	---	12	E	6	5	9	16	6.8	11	0
Mobile	211	1007.8	1015.9	87	70	78.4	----	96	4	60	29	12	0	70	82	7.44	----	2.10	12	16	.0	0	8.3	NE	-		-	7	10	13	6.7	-	0
Montgomery CO	201	------	------	87	69	78.0	+1.7	100	5	56	29	9	0	-	-	10.11	+7.12	3.30	13	6	.0	0	----	-	---			---	---	--	---		0
Montgomery	198	1009.1	1016.6	88	68	77.9	+1.6	101	5	55	29	12	0	68	78	7.70	+4.71	3.84	13	[illegible]	.0	0	[illegible]	N	33	S	12	7	7	16	6.5	58	0
ARIZONA																																	
Flagstaff	6993	790.4	1017.5	77	39	57.9	----	82	17	29	22	0	2	35	49	.60	-----	.34	5	2	.0	0	5.0	SW			-	25	3	2	1.5	--	203
Payson CO	5000	849.0	1013.4	87	53	70.0	----	92	15	18	2	6	0	45	43	.66	---	.58	3	4	.0	0	3.4	NE	-	-	--	27	1	2	1.1		5
Phoenix CO	1083	------	------	100	70	84.8	+2.1	105	14	65	23	29	0	-	--	.33	-.42	.33	1	1	.0	0	5.6	---	20	W	28				-	96	0
Phoenix	1108	970.5	1008.6	99	67	83.2	----	103	13	62	23	29	0	58	47	.33	.42	.33	1	1	.0	0	3.6	E	---	--		25	4	1	1.0	--	0
Prescott	5014	848.0	1012.4	87	51	69.0	----	92	15	42	22	9	0	40	39	.26	----	.18	3	5	T	0	8.1	SW	27	SW	11	27	2	1	1.4	90	4
Tucson	2558	923.1	1008.9	98	68	83.2	+3.5	104	15	63	2	28	0	46	31	.34	-.84	.32	2	4	.0	0	6.3	SE	34	E	6	24	3	3	1.7	91	0
Winslow	4880	852.4	1011.1	88	52	70.2	+2.3	94	10	46	22	11	0	34	32	.15	-.63	.15	1	3	.0	0	6.5	SW	*28	WSW	11	26	2	2	1.4	--	2
Yuma	203	1002.0	1006.9	107	75	90.6	----	112	17	70	25	30	0	59	40	T	----	T	0	2	.0	0	6.0	SSE	23	S	29	28	2	0	.6	99	0
ARKANSAS																																	
Fort Smith	458	999.7	1016.2	84	62	72.5	-1.5	100	1	50	17	7	0	63	79	5.57	+2.58	1.46	10	10	.0	0	7.0	NE	29	NW	12	16	7	7	4.0	66	8
Little Rock	257	1002.7	1016.6	83	62	72.6	-1.5	100	1	47	29	7	0	63	79	4.00	+.83	1.52	10	7	.0	0	6.6	NNE	31	NE	27	13	5	12	5.2	69	6
Texarkana	361	1002.7	1016.0	87	65	75.9	-1.5	105	1	51	29	11	0	66	79	5.32	+2.74	1.59	10	12	.0	0	7.7	NE	--			13	6	11			0
CALIFORNIA																																	
Bakersfield	489	993.2	1010.6	93	62	77.9	+3.7	107	16	53	29	23	0	51	41	.00	-.13	.00	0	0	.0	0	4.2	WNW	--			29	1	0	.3	--	0
Beaumont CO	2589	923.1	1011.6	93	55	74.3	----	103	15	45	29	21	0	41	36	.17	----	.17	1	1	.0	0	6.9	NW	*16	SW	11	25	5	0	1.4		8
Bishop	4108	872.7	1011.2	93	49	70.9	----	99	10	41	29	25	0	--	--	T	----	T	0	0	.0	0						25	4	1	1.6		10
Blue Canyon	5280	840.2	1011.7	77	56	66.6	----	88	15	45	29	0	0	34	33	.16	----	.16	1	2	.0	0	8.6	SW				24	4	2	1.5		55
Burbank	699	985.4	1011.5	86	59	72.5	----	101	17	53	3	9	0	57	66	T	----	T	0	0	.0	0	5.0	SE	*18	WNW	19	21	9	0	2.1	-	0
Eureka CO	43	1013.2	1015.6	59	51	55.1	-.8	68	29	47	22	0	0	--	--	.79	-.22	.57	3	0	.0	0	5.6	--	24	N	11	3	3	24	8.3	17	289
Fresno	331	999.3	1010.9	93	57	75.0	+3.0	103	10	50	29	22	0	55	53	.00	-.21	.00	0	0	.0	0	5.9	WNW	18	SW	18	27	2	1	.9	99	0
Los Angeles CO	312	------	------	81	61	71.0	+2.0	92	16	57	1	3	0	--	--	.00	-.17	.00	0	2	.0	0	4.7	--	17	W	28	20	10	0	2.3	82	0
Los Angeles	99	1008.1	1011.7	74	61	67.4	----	83	18	57	6	0	0	58	76	T	-----	T	0	0	.0	0	4.5	WSW				11	14	5	4.4	-	0
Mt. Shasta CO	3543	892.0	1014.3	83	47	64.7	+5.9	95	15	39	1	7	0	39	14	.27	-.56	.27	1	0	.0	0	6.4	NW	--	---	--	22	3	5	2.4	--	62
Oakland	3	1013.2	1013.6	71	56	63.6	+1.7	93	8	53	11	2	0	53	75	T	-.41	T	0	0	.0	0	5.7	W	---	---	--	7	14	9	5.2	-	65
Red Bluff	341	998.6	1011.0	93	62	77.0	+3.9	110	9	54	6	22	0	44	36	.33	+.17	.34	1	0	.0	0	5.5	SSE	28	NW	11	23	2	5	2.4	89	2
Sacramento CO	25	------	------	---	--	---	----	--	--	--	--	--	--	--		-	----	-	-	-	---	-	----	---	--		-	--	--	--	--	--	3
Sacramento	17	1010.5	1011.3	87	55	71.2	+1.9	100	9	48	6	13	0	53	60	.14	-.24	.13	3	2	.0	0	9.2	SW	24	SW	28	25	2	3	1.5	93	3
Sandberg CO	4517	862.5	1011.2	85	61	73.0	----	94	15	47	28	10	0	36	31	.00	-----	.00	0	0	.0	0	14.7	NW	---	--	--	29	1	0	.6	-	17
San Diego	19	1008.1	1011.4	74	61	67.8	-.4	87	20	55	29	0	0	60	79	.04	-.04	.04	1	2	.0	0	5.7	W	17	NW	13	14	11	5	4.3	59	1
San Francisco CO	52	------	------	66	54	59.8	-1.1	89	8	51	26	0	0	--	--	.08	-.37	.04	3	0	.0	0	9.7	---	27	W	11	7	7	16	6.5	53	172
San Francisco	1	1012.9	1013.5	70	54	62.1	+2.1	93	8	49	11	2	0	54	81	T	-.10	T	0	0	.0	0	12.9	WNW	34	W	13	10	12	8	4.9	--	102
Santa Catalina	1568	955.3	1010.6	77	60	68.7	----	92	17	52	2	6	0	--	--	.00	-----	.00	0	0	.0	0	---		---	-	-	25	5	0	1.7	-	53
Santa Maria	231	1004.4	1013.1	73	52	62.7	----	86	15	46	8	0	0	54	81	.06	-----	.05	2	2	.0	0	5.1	W	*18	WNW	2	14	14	2	3.8	-	79
COLORADO																																	
Alamosa'	7534	774.1	1016.9	76	33	54.7	----	85	3	22	22	0	14		-	.05	-----	.05	1	0	.0	0	---	---	--	--	--	24	4	2	1.9	-	304
Colorado Springs	6175	812.7	1015.4	73	45	59.1	----	86	11	29	28	0	2	35	50	.85	---	.40	5	4	.8	T	10.5	SSE	---	--	--	18	6	6	3.6	--	183
Denver	5292	839.1	1014.2	77	46	61.5	-.1	92	11	32	21	1	1	37	48	.97	-.51	.70	4	0	4.2	3	7.2	S	34	N	°8	13	12	5	4.0	77	139
Grand Junction	4849	859.1	1012.8	81	51	66.3	+.1	88	6	41	22	0	0	30	29	.32	-.60	.26	4	2	.0	0	9.0	ESE	40	N	11	25	3	2	1.8	89	36
Pueblo	4799	857.4	1013.9	79	48	63.6	-1.0	93	11	31	16	4	1	40	51	.58	.17	.28	4	2	T	T	7.1	E	40	N	11	16	8	6	3.7	73	115
CONNECTICUT																																	
Bridgeport	7	1018.0	1018.4	75	56	65.3	----	84	12	37	30	0	0	56	74	1.06	----	.35	7	3	.0	0	7.8	SW	*25	NW	28	10	9	11	5.6	--	63
Hartford	15	1012.5	1018.1	75	52	63.2	+1.5	86	12	31	30	0	1	55	79	2.00	-1.49	1.00	7	1	.0	0	6.1	S	25	NW	29	6	8	16	6.8	53	101
New Haven	6	1014.2	1018.3	74	55	64.4	+2.6	81	14	36	30	0	0	--	-	1.32	-1.92	.48	9	2	.0	0	6.7	---	20	S	6	9	10	11	5.8	65	72
DELAWARE																																	
Wilmington	73	1015.2	1018.2	78	56	67.0	----	88	1	38	30	0	0	57	75	1.16	---	.70	7	1	.0	0	7.3	S	--	---	--	11	7	12	5.5	--	45
FLORIDA																																	
Apalachicola	13	1013.9	1015.2	85	74	79.7	+1.2	93	1	67	9	4	0	--	--	14.93	+6.84	8.75	17	17	.0	0	7.3	---	43	N	2	6	8	16	6.8	49	0
Daytona Beach	33	1014.6	1016.2	89	71	79.8	+.9	95	4	64	10	12	0	73	85	14.02	+7.55	4.09	12	11	.0	0	6.7	E	*30	WSW	3	10	9	11	5.5	--	0
Fort Myers	15	1014.6	1014.9	91	74	82.4	+1.9	95	4	71	27	26	0	74	80	3.48	-3.97	1.84	12	13	.0	0	6.8	E	---	---	--	6	15	9	5.8	--	0
Jacksonville CO	18	------	------	88	73	80.5	+2.2	96	7	68	°10	12	0	--	--	6.19	-1.16	2.12	13	--	.0	0	----	--	--	---	--	--	--	--	-	--	0
Jacksonville	52	1015.6	1016.7	90	72	81.0	+2.7	97	4	66	10	18	0	71	76	10.11	+2.76	4.33	14	9	.0	0	5.4	NE	34	SE	2	5	12	13	6.7	37	0
Key West CO	5	1013.2	1013.9	91	79	85.2	+3.0	95	6	75	1	26	0	--	--	2.96	-3.74	.68	18	4	.0	0	7.6	NE	20	SE	30	10	15	5	5.2	75	0
Key West	6	1013.5	1014.4	90	79	84.7	+2.8	94	4	73	7	19	0	74	72	1.70	-5.00	.75	10	5	.0	0	11.0	E	---	---	--	6	18	6	5.4	--	0
Lakeland CO	214	------	------	90	74	81.7	+1.4	94	3	70	19	17	0	--	--	6.60	+.16	2.73	14	12	.0	0	-	E	--	--		9	15	6	5.4	--	0
Melbourne	22	1014.9	1016.1	89	73	81.2	+1.5	95	2	69	1	10	0	72	79	9.81	+1.81	2.19	15	13	.0	0	8.0	E	*28	SW	17	4	15	11	6.2	--	0
Miami CO	180	------	------	87	78	82.6	+1.7	90	8	73	10	1	0	--	--	3.14	-5.51	1.87	13	8	.0	0	10.5	E	32	E	21	3	19	8	5.8	58	0
Miami	9	1013.9	1015.1	90	76	83.3	----	93	7	73	14	21	0	74	76	2.63	----	.63	11	6	.0	0	7.1	E	*25	SSE	10	6	14	10	6.2	--	0
Miami Beach	3	------	------	87	80	83.2	---	90	8	75	9	1	0	--	--	1.97	-----	.68	11	--	.0	0	----	E	--	---	--	8	12	10	---	--	0
Orlando	111	1011.9	1015.1	90	72	81.4	+1.5	94	5	68	10	21	0	73	81	9.34	+2.64	2.75	13	11	.0	0	7.8	ENE	*30	SSE	4	6	13	11	6.2	--	0
Pensacola CO	13	1013.2	------	86	73	79.4	+1.4	94	4	65	30	7	0	--	--	10.24	+4.91	2.94	17	12	.0	0	6.9		24	E	2	7	8	15	6.6	61	0
Pensacola CAA AP	110	------	1015.4	--	--	----	----	--	--	--	--	--	-	72	--	-----	-----	----	--	--	--	-	6.3	NE	--	---	--	--	--	--	---	--	---
Tallahassee	64	1013.5	1016.3	88	71	79.9	----	97	1	66	18	16	0	71	81	6.68	-----	1.91	14	12	.0	0	4.8	NE	---	- -	--	2	13	15	7.0	--	0
Tampa	24	1014.2	1015.6	91	74	82.4	+2.5	95	3	69	10	24	0	73	78	9.60	+3.18	3.90	10	13	.0	0	5.9	E	27	S	17	5	16	9	6.0	71	0
West Palm Beach	14	1014.2	1015.1	92	75	83.3	----	96	3	72	5	27	0	73	77	6.90	-2.07	2.91	12	13	.0	0	6.9	E	---	---	--	7	13	10	6.0	--	0
GEORGIA																																	
Albany	190	1009.8	1016.8	90	70	79.7	+.7	101	5	63	29	17	0	68	75	6.11	+2.54	1.90	13	8	.0	0	3.4	NE	---	---	--	4	13	13	6.8	-	0
Atlanta CO	1054	------	------	83	66	74.1	+1.7	95	1	53	29	5	0	--	--	3.87	+.88	1.73	9	--	.0	0	--	-		-	--	--			-	--	3
Atlanta	977	976.6	1017.3	83	65	73.9	+1.1	96	4	54	29	6	0	63	75	5.58	+2.54	2.12	10	5	.0	0	9.9	NNW	38	NW	22	10	7	13	6.0	66	3
Athens	798	988.8	------	85	64	74.3	----	98	3	55	°9	8	0	--	-	4.73	----	1.66	9	4	.0	0	----	--	---	-		7	9	11	6.3	-	3
Augusta	426	1010.5	1017.1	86	65	75.5	+.2	99	4	52	9	11	0	66	79	4.17	+.74	1.90	8	4	.0	0	4.7	SE	*19	SE	5	5	7	18	7.0		0
Columbus	382	1002.7	1016.7	86	67	76.5	----	98	4	58	29	10	0	67	77	6.94	-----	3.09	12	9	.0	0	5.8	N	--	--		8	6	16	6.4	-	0
Macon	354	1003.4	1016.6	88	67	77.6	----	101	4	58	20	11	0	66	74	3.26	--	1.53	12	4	.0	0	7.8	NE	36	S	25	7	8	15	6.4	71	0
Rome	637	994.6	1017.6	86	62	74.0	----	100	1	46	29	8	0	64	79	6.61	---	1.85	13	9	.0	0	6.4	N	---	---	--	10	11	9	5.3	--	3
Savannah	38	1014.6	1016.8	85	69	77.0	+2.7	96	4	63	10	3	0	69	82	6.06	+.65	1.59	11	10	.0	0	6.9	NE	25	NW	4	4	10	16	7.1	41	0
Valdosta	200	1008.1	1016.1	90	69	79.2	+.5	100	1	64	18	19	0	69	--	7.74	+3.06	1.99	11	7	.0	0	7.5	NE	---	---	--	7	9	14	6.5	--	0
IDAHO																																	
Boise	2842	918.4	1013.2	78	49	63.6	+2.4	93	7	37	26	2	0	36	37	.01	-.52	.01	1	0	.0	0	6.9	SE	29	NW	11	21	6	3	2.7	87	88
Lewiston	1413	963.4	1014.5	79	48	63.6	----	90	15	39	27	1	0	41	47	.34	----	.30	3	0	.0	0	3.4	E	--	---	--	14	7	9	4.5	--	77
Pocatello	4444	862.9	1014.2	77	43	60.1	+.8	88	7	30	12	0	3	31	36	.02	-.72	.02	1	1	.0	0	7.4	SW	40	SW	19	18	9	3	3.2	83	147
ILLINOIS																																	
Cairo CO	314	1004.4	1016.9	79	61	69.8	-2.7	95	1	45	29	1	0	--	--	4.52	+1.63	2.25	12	5	.0	0	7.1	--	24	N	24	9	9	12	5.7	65	24
Chicago	618	993.6	1016.4	73	53	62.9	-2.0	90	12	37	29	1	0	51	74	5.29	+2.09	2.55	8	4	.0	0	8.9	SSW	45	W	27	12	8	10	5.4	62	114
Joliet	580	994.9	1016.4	73	49	61.1	-2.7	91	12	33	29	1	0	52	81	6.23	+2.46	2.77	9	5	.0	0	10.4	S	--	---	--	10	7	13	5.6	--	152
Moline	589	994.6	1016.9	72	51	61.8	-2.1	87	11	35	28	0	0	52	77	3.47	-.11	1.23	7	4	.0	0	10.0	SW	52	W	12	11	8	11	5.5	62	130
Peoria	659	994.6	1017.0	73	52	62.3	-3.6	89	12	35	28	0	0	53	79	2.50	-1.53	1.28	9	4	T	T	10.0	S	50	W	26	10	10	10	5.4	59	119
Springfield CO	----	------	------	--	--	----	----	--	--	--	--	--	-	--	--	----	-----	----	--	--	---	-	----	---	--	---	--	--	--	--	---	--	71
Springfield	598	993.2	1016.8	73	54	63.4	-1.4	88	12	36	29	0	0	54	77	2.76	-.88	.77	12	6	.0	0	11.5	SSW	42	NW	22	13	6	11	5.3	62	101

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	1002.0	1017.8	79	55	66.8	-0.9	93	1	39	29	2	0	57	79	3.42	+0.11	1.73	8	5	0.0	0	8.2	NNW	35	S	12	12	9	9	5.0	74	55
Fort Wayne	801	986.5	1017.4	73	50	61.3	-1.8	88	12	29	29	0	1	52	79	1.48	-1.58	.40	8	1	.0	0	7.8	SW	30	SW	21	8	12	10	5.9	74	140
Indianapolis CO	---	----	----	--	--	----	----	--	--	--	--	-	-	--	--	----	----	----	--	--	---	-	---	---	---	---	--	--	--	--	---	--	69
Indianapolis	796	988.5	1017.7	75	50	62.6	-2.8	90	12	35	29	1	0	50	84	2.39	-1.01	.87	10	3	T	T	9.9	SW	40	W	26	9	9	12	5.7	65	112
South Bend	768	988.5	1016.7	71	50	60.7	-4.8	87	12	32	29	0	1	52	80	4.49	+1.14	1.71	10	5	T	T	10.8	SSW	*35	NW	26	8	10	12	5.9	--	157
Terre Haute	585	997.0	1017.9	74	51	62.7	-5.6	90	12	34	29	1	0	54	80	3.22	-.40	.92	11	4	.0	0	6.9	S	32	W	26	8	12	10	5.4	58	108
IOWA																																	
Burlington	605	991.2	1016.7	73	51	61.9	-4.5	89	26	32	28	0	1	52	79	1.76	-2.70	.56	9	5	.0	0	9.1	SSW	33	NW	26	11	8	11	5.6	59	125
Charles City CO	1013	978.7	1015.6	68	48	57.9	-3.1	84	11	30	28	0	1	--	--	2.67	-1.01	1.22	9	4	.0	0	5.8	---	22	S	12	8	13	9	5.5	56	215
Davenport CO	579	994.6	--	72	54	62.9	-2.7	86	11	35	28	0	0	--	--	3.01	-.57	1.20	8	4	.0	0	----	---	---	---	--	--	--	--	----	---	105
Des Moines	800	985.1	1016.4	71	51	60.8	-4.5	87	11	31	28	0	1	52	78	1.39	-2.26	.96	6	1	.0	0	11.1	WNW	35	SW	26	11	4	15	6.0	54	147
Dubuque	641	976.6	1015.8	69	48	58.3	--	83	11	33	28	0	0	49	81	1.47	-----	.46	11	2	.0	0	10.5	SSW	*32	W	27	--	--	--	6.2	--	206
Sioux City	1097	974.3	1015.4	70	48	58.9	-3.6	87	11	27	28	0	1	50	80	3.61	+.58	2.44	11	5	.0	0	7.8	NW	32	NW	26	11	5	14	6.0	50	195
KANSAS																																	
Concordia CO	1375	966.5	1015.9	73	54	63.3	-5.0	89	11	34	28	0	0	--	--	4.50	+1.90	1.86	8	8	T	T	7.7	--	26	NW	12	9	4	17	6.3	45	113
Dodge City	2594	930.9	1014.6	77	53	65.1	-4.3	92	11	35	22	1	0	51	68	2.66	+.76	1.52	9	5	.0	0	14.7	S	45	SW	29	10	7	13	5.2	55	96
Goodland	3645	889.3	1014.9	76	46	61.1	-5.2	96	11	31	27	2	1	44	64	1.46	-.14	.48	9	7	T	T	10.8	SE	*34	NNW	11	12	9	9	4.9	--	154
Topeka CO	---	----	----	--	--	----	----	--	--	--	--	-	-	--	--	----	----	----	--	--	---	-	----	---	---	---	--	--	--	--	----	--	84
Topeka	926	981.0	1016.4	75	54	64.6	----	90	11	37	28	1	0	56	80	4.99	-----	2.27	11	8	.0	0	9.4	S	52	S	12	11	3	16	6.0	49	91
Wichita	1372	967.5	1015.6	76	57	66.2	-4.4	87	11	41	22	0	0	56	76	6.59	+3.50	2.19	11	8	T	T	12.7	S	46	S	11	11	6	13	5.5	56	59
KENTUCKY																																	
Lexington	979	982.4	1018.2	79	56	67.4	-1.1	94	1	39	29	2	0	55	70	3.60	+.53	1.68	9	4	.0	0	8.6	S	--	---	--	14	10	6	4.3	--	54
Louisville CO	----	------	------	77	58	67.7	-2.8	91	1	42	29	1	0	--	--	3.09	+.31	1.34	9	1	.0	0	--	---	---	---	--	--		-	---	--	38
Louisville	485	1001.0	1017.5	79	55	67.4	-1.6	95	1	39	29	2	0	57	73	3.15	+.37	1.58	7	5	.0	0	6.8	SE	30	S	21	11	12	7	4.9	73	45
LOUISIANA																																	
Baton Rouge	64	1014.2	1015.4	88	67	78.5	+.2	98	3	55	19	13	0	68	81	4.58	+.02	3.32	10	13	.0	0	5.1	SE	---	---	--	7	12	11	5.9	--	0
Lake Charles	12	1013.9	1015.1	87	69	77.9	-.4	98	3	59	19	11	0	70	88	4.63	+.22	2.74	13	15	.0	0	8.0	NE	---	---	--	6	12	12	6.1	--	0
New Orleans CO	12	1013.2	------	88	74	80.6	+1.4	95	4	66	29	13	0	--	--	6.16	+1.13	1.74	14	17	.0	0	5.8	---	20	N	7	3	16	11	6.4	41	0
New Orleans	12	1013.2	1015.3	88	72	80.0	-	96	5	65	19	12	0	72	84	7.04	-----	1.89	14	17	.0	0	7.2	NE	*26	SW	13	10	9	11	5.4	--	0
Shreveport	171	1006.8	1015.6	88	67	77.5	+.2	102	2	54	29	11	0	66	78	5.52	+2.72	1.90	11	10	.0	0	7.7	NE	59	E	4	14	8	8	4.6	78	0
MAINE																																	
Caribou	624	992.2	1015.3	66	45	55.1	+2.6	87	13	30	27	0	3	48	78	2.26	-1.33	.90	11	0	.0	0	11.2	S	*38	W	27	6	13	11	6.2	--	314
Eastport	33	1013.9	1016.6	65	51	58.2	+2.4	82	13	38	30	0	0	--	--	3.14	+.36	1.09	10	0	.0	0	8.1	---	26	SW	28	10	12	8	5.2	68	200
Portland	61	1013.2	1017.1	70	48	59.2	+1.3	87	12	27	30	0	2	54	83	2.38	-.72	.62	9	2	.0	0	7.5	S	26	SE	6	11	9	10	5.3	63	195
MARYLAND																																	
Baltimore CO	14	------	------	79	62	70.5	+2.0	91	1	45	29	1	0	--	--	3.48	+.11	2.82	--	--	---	-	----	---	---	---	--	--	--	--	---	--	23
Baltimore	146	1011.9	1018.8	80	57	68.3	----	91	1	38	29	1	0	58	74	4.13	----	2.05	6	2	.0	0	9.6	S	33	NW	28	12	10	8	5.1	57	39
Frederick	294	-----	-----	82	55	68.4	----	94	1	34	30	4	0	--	-	1.64	-----	.58	9	1	.0	0	----	---	---	---	--	--	--	--	---	--	43
MASSACHUSETTS																																	
Boston	12	1013.5	1017.8	74	57	65.6	+2.4	90	12	39	30	1	0	53	69	2.00	-1.14	.61	7	0	.0	0	11.7	SW	32	S	6	11	9	10	5.2	66	65
Nantucket	43	1017.6	1017.9	71	58	64.7	+1.9	77	15	43	26	0	0	59	82	1.98	-.47	.87	10	0	.0	0	8.1	SSW	29	SW	23	10	8	12	5.5	60	60
Pittsfield	1153	975.6	1018.0	69	46	57.1	-.3	82	12	25	30	0	1	--	-	3.49	-.53	1.37	8	1	.0	0	6.9	---	--	---	--	5	15	10	6.0	--	241
MICHIGAN																																	
Alpena CO	587	992.6	1012.9	65	48	56.4	-1.2	83	12	31	29	0	1	--	--	2.59	-.39	.97	11	4	.0	0	11.0	---	45	S	26	8	6	16	6.4	59	265
Detroit	619	990.2	1016.6	72	53	62.5	+.1	86	21	35	29	0	0	51	72	1.97	-.93	.62	8	1	.0	0	9.4	S	38	WNW	27	12	9	9	5.2	64	116
Escanaba CO	594	991.5	1013.9	63	48	55.3	-1.8	73	18	34	29	0	0	--	--	3.77	+.45	1.08	14	5	T	T	10.8	---	35	SE	26	7	13	10	5.9	56	284
Grand Rapids CO	----	------	---	--	--	---	---	--	--	--	--	--	-	--	--	----	-----	----	--	-	---	-	----	----	--	---	--	--	--	--	---	--	144
Grand Rapids	638	990.9	1016.1	70	49	59.5	-.5	87	12	30	29	0	1	49	78	4.71	+1.18	1.48	14	5	.0	0	9.3	WSW	46	W	27	6	13	11	6.2	62	188
Lansing	859	984.8	1016.6	70	49	59.3	-2.4	85	12	30	29	0	1	50	77	2.59	-.32	.58	11	7	.0	0	10.7	SSW	47	S	26	11	11	8	5.4	65	190
Marquette CO	677	986.1	1013.2	62	47	54.4	-3.1	80	11	33	29	0	0	--	--	3.54	+.29	1.15	15	3	T	T	8.7	--	28	W	27	4	7	19	7.5	53	319
Muskegon	627	992.6	1015.7	68	49	58.7	-3.5	88	12	31	8	0	2	51	78	3.94	+.74	1.40	11	6	.0	0	11.0	W	*44	W	27	6	12	12	6.2	--	205
Sault Ste. Marie	721	990.5	1014.2	62	44	52.9	-1.1	81	12	31	25	0	2	47	86	4.80	+1.26	1.52	15	2	T	T	9.5	SW	38	W	27	6	8	16	6.9	47	363
Ypsilanti	722	988.2	1016.5	72	50	61.3	---	87	12	34	29	0	0	50	74	1.51	-----	.58	8	3	.0	0	9.8	SW	*40	W	14	10	10	10	5.0	--	137
MINNESOTA																																	
Duluth	1128	971.6	1013.1	59	43	51.0	----	75	18	30	28	0	4	46	89	6.25	-----	2.25	14	4	T	T	11.1	W	38	W	26	1	7	22	8.3	36	415
Intern'l. Falls	1179	969.2	1012.6	60	41	50.6	-4.7	77	18	23	25	0	6	46	87	3.57	+1.18	1.15	10	2	1.5	1	----	---	---	---	--	2	5	23	8.2	--	428
Minneapolis	830	981.0	1014.6	66	48	56.9	-4.5	86	11	32	28	0	1	48	79	5.80	+2.67	2.03	13	6	T	T	10.7	W	47	N	20	8	7	15	6.5	46	242
Rochester	1014	977.7	1015.1	68	46	56.9	-3.8	85	11	31	28	0	1	49	80	2.82	-.45	1.13	11	6	T	0	9.6	WNW	---	---	--	4	12	14	6.9	--	244
St. Cloud	1034	975.6	1013.8	65	44	54.3	-5.7	84	11	28	28	0	2	47	85	2.75	-.36	1.06	13	3	.0	0	7.1	WNW	---	---	--	5	9	16	7.0	--	318
St. Paul	703	987.8	1014.0	67	48	57.2	-4.1	86	11	33	28	0	0	48	78	5.82	+2.75	2.93	12	7	T	T	8.6	WSW	*33	WSW	12	5	9	16	6.9	--	235
MISSISSIPPI																																	
Jackson	315	1004.4	1016.3	90	66	78.3	+1.3	103	°1	53	29	15	0	65	72	3.08	+.17	.91	10	6	.0	0	7.1	NNE	37	SE	12	13	8	9	4.6	64	0
Meridian	294	1002.7	1016.2	89	66	77.7	+1.7	102	1	52	19	13	0	65	74	4.52	+1.56	1.80	10	6	.0	0	5.0	NE	---	---	--	9	12	9	5.4	--	0
Vicksburg	234	1008.1	------	86	67	76.9	+.6	99	1	53	29	12	0	--	--	6.30	+3.43	2.59	11	7	.0	0	7.9	---	28	N	10	6	14	10	5.6	66	0
MISSOURI																																	
Columbia	733	988.2	1016.7	75	55	64.9	-3.9	87	26	36	28	0	0	56	80	4.95	+.60	1.33	13	10	.0	0	8.9	S	44	NW	4	12	6	12	5.3	62	80
Kansas City	741	981.7	1016.4	75	57	66.0	-2.9	89	11	38	28	0	0	56	74	5.67	+1.85	2.03	11	8	.0	0	8.5	SSW	50	NW	4	10	5	15	5.8	54	68
St. Joseph	809	981.0	1016.0	74	54	64.1	-4.3	89	11	35	28	0	0	55	80	5.26	+1.34	1.49	12	7	.0	0	9.1	SSE	30	S	12	11	2	17	5.9	54	94
St. Louis CO	465	997.0	-- ---	76	59	67.0	-3.5	88	1	43	28	0	0	--	--	3.66	+.20	1.32	14	8	.0	0	10.5	--	47	SW	12	13	9	8	5.1	68	42
St. Louis	465	997.0	1017.3	76	57	66.3	-2.5	89	12	40	29	0	0	56	77	3.15	-1.22	.95	12	8	.0	0	7.1	NW	---	---	--	10	11	9	5.3	--	56
Springfield	1265	969.5	1016.9	76	56	65.7	-2.7	90	1	44	28	1	0	57	82	4.86	+1.34	1.86	12	10	.0	0	11.4	SSE	45	W	12	9	11	10	5.4	62	69
MONTANA																																	
Billings	3568	892.3	1015.9	67	42	54.5	-5.7	86	10	27	27	0	3	36	54	1.01	----	.49	8	1	T	0	10.2	SW	50	NW	10	7	13	10	5.6	71	312
Butte	5530	831.4	1018.6	64	33	48.7	-3.0	81	7	24	15	0	13	34	62	.97	+.13	.64	7	0	3.5	2	8.6	NW	---	---	--	5	13	12	6.1	--	480
Glasgow CO	2090	941.1	1015.6	67	40	53.4	-3.9	85	17	25	27	0	6	40	64	1.40	+.31	.35	12	2	2.3	T	---	---	---	---	--	6	9	15	6.6	--	343
Great Falls	3664	889.6	1016.6	64	42	52.6	-5.3	84	7	26	26	0	4	37	61	1.44	.00	.33	10	1	.6	1	11.2	WSW	47	SW	25	8	5	17	6.5	53	368
Havre CO	2488	927.5	1016.6	65	41	53.2	-3.2	85	7	27	26	0	4	--	--	1.36	+.07	.38	12	1	1.6	T	8.0	---	30	NW	8	9	9	12	5.6	61	349
Helena	3893	875.4	1017.6	65	39	51.9	-3.5	86	7	27	26	0	4	39	65	.81	-.44	.31	6	0	.4	T	5.9	W	51	W	25	7	7	16	6.4	61	338
Kalispell	2965	912.6	1015.9	65	39	52.0	----	78	16	29	28	0	2	40	67	1.88	-----	.70	11	2	.0	0	6.9	NE	---	---	--	12	3	15	5.8	--	383
Miles City	2629	931.9	1016.2	66	42	53.6	---	84	10	22	27	0	3	42	--	1.42	-----	.53	13	4	.0	0	9.6	WNW	-	---	--	7	12	11	6.3	--	335
Missoula	3201	902.8	1016.9	68	41	54.5	+1.0	85	7	31	21	0	2	40	61	1.28	+.03	.42	9	0	.0	0	5.7	N	39	N	19	9	6	15	6.2	51	306
NEBRASKA																																	
Grand Island	1841	949.2	1015.1	71	48	59.4	----	90	11	27	28	2	1	49	74	2.30	-----	.73	10	8	.0	0	11.9	SSE	---	---	-	9	8	13	5.9	--	188
Lincoln CO	1184	------	------	72	53	62.2	-4.2	89	11	30	28	0	1	--	-	3.12	+.14	1.12	11	6	.0	0	8.1	--	30	NW	26	--	--	--	---	42	120
Lincoln	1180	972.9	1015.9	71	50	60.9	-4.4	89	11	28	28	0	1	52	--	2.71	-.27	.72	11	8	.0	0	9.1	NNW	---	---	--	9	5	16	6.1	--	148
Norfolk	1554	960.0	1015.6	69	49	58.9	-5.1	88	20	28	28	0	1	49	77	2.49	-.38	1.05	11	5	T	T	11.1	NW	---	---	--	11	8	11	5.4	--	200
North Platte	2783	916.7	1014.9	72	46	58.9	-3.2	88	11	24	28	0	2	47	72	2.13	+.78	.63	12	8	.0	0	9.0	SE	37	N	14	11	9	10	5.4	58	198
Omaha	978	976.3	1016.0	72	62	62.0	-3.7	90	11	31	28	1	1	53	76	2.71	-.50	1.07	8	5	.0	0	9.5	SSE	35	N	26	10	5	15	6.1	50	128
Scottsbluff	3950	880.1	1015.2	72	44	58.1	-3.7	91	8	29	27	1	3	42	65	3.82	+2.52	3.28	9	5	T	0	8.0	NW	---	---	--	11	11	8	4.9	--	212
Valentine CO	2581	924.1	1015.6	69	45	56.9	-5.6	88	30	25	28	0	2	--	--	1.78	+.48	.73	10	6	T	0	8.1	---	30	NW	26	6	13	11	5.7	62	249

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb	Mb.	°F	°F.	°F.	°F.	°F		°F				°F	%	In.	In	In			In.	In.	M. p h		M p h			0–3	4–7	8–10	0–10	%	
NEVADA																																	
Elko	5075	845.6	1015.0	82	36	59.0	---	91	16	27	22	3	7	32	38	T	-----	T	0	0	.0	0	5.1	SW			--	25	2	3	1.8	—	175
Ely	6257	810.7	1015.2	79	36	57.6	+5.2	87	17	25	12	0	6	--	--	.10	-.53	.08	2	1	.0	0	10.6	---	43	S	28	24	3	3	1.8	91	214
Las Vegas	2162	932.3	1008.4	98	64	81.4	+6.0	105	8	53	22	27	0	25	17	.98	+.65	.98	1	1	.0	0	5.4	SW	-	- -		29	0	1	.5	96	0
Reno	4397	862.2	1013.6	85	40	62.3	+4.3	93	10	32	29	5	2	36	44	.37	+.11	.37	1	2	.0	0	3.9	WNW	35	SW	17	25	5	0	1.4	94	92
Winnemucca	4299	867.9	1014.1	84	38	61.1	+1.9	94	16	25	22	7	7	26	26	T	.41	T	0	0	.0	0	7.6	--	30	N	17	23	5	2	1.8	97	131
NEW HAMPSHIRE																																	
Concord	339	1006.8	1017.6	71	47	59.0	+1.0	87	12	27	30	0	3	51	80	2.93	.52	.72	11	2	.0	0	1.5	SE	24	NW	29	9	9	12	5.8	46	198
Mt. Washington	6262	809.0	1021.7	47	35	40.8	-.2	63	15	12	26	0	9	-	88	7.21	-.27	1.65	16	1	2.7	1	30.6	W	*101	W	29	6	8	16	7.0	38	720
NEW JERSEY																																	
Atlantic City CO	8	1015.9	1017.6	75	63	69.1	+2.3	82	1	44	29	0	0	--	-	1.40	-1.25	.42	8	1	.0	0	12.9		35	SW	6	14	7	9	4.7	69	29
Newark	11	1017.6	1018.2	77	57	67.1	+.6	86	21	41	30	0	0	55	69	.95	-2.82	.32	8	1	.0	0	8.2	SW	*25	WNW	28	7	12	11	6.1		48
Trenton CO	56	1011.2	1018.0	77	57	66.9	.0	87	12	39	30	0	0			1.11	-2.29	.34	2	0	.0	0	7.8		26	NW	28	9	12	9	5.4	69	45
NEW MEXICO																																	
Albuquerque	5310	849.3	1011.1	87	57	71.9	+4.0	95	4	46	22	8	0	36	30	.05	-.77	.05	1	3	.0	0	7.4	S	40	E	15	23	5	2	1.7	91	3
Clayton	4969	846.3	1013.6	80	49	64.6	-1.2	93	3	34	16	6	0	45	56	.39	-1.45	.35	3	2	.0	0	14.2	SSW	---	-		18	5	7	3.7		94
Raton	6379	807.0	1013.4	78	43	60.6	---	88	4	27	16	0	2	36	17	.11	-----	.10	2	3	.0	0	8.6	SW				17	8	5	3.4	-	151
Roswell	3611	893.0	1012.1	90	55	72.6	+2.3	100	1	41	17	19	0	43	40	.02	2.09	.02	1	1	.0	0	8.4	SSE	34	NW	29	24	5	1	1.8	91	17
NEW YORK																																	
Albany	277	1012.9	1017.3	71	49	60.2	1.0	86	12	29	30	0	1	53	79	5.44	+2.63	2.65	11	1	.0	0	7.0	S	31	S	27	3	17	10	6.3	64	172
Bear Mountain	1300	------	-----	69	54	61.2		82	12	36	29	0	0	--	--	2.06	----	.98	7	0	.0	0						7	9	14	6.3	--	151
Binghamton	1638	891.3	1018.0	69	49	59.1	---	83	13	30	30	0	1	50	76	3.11	----	.89	9	4	.0	0	11.3	S	34	SE	22	5	13	12	6.5	51	194
Buffalo	693	988.8	1017.5	71	52	61.3	-.3	89	12	36	29	0	0	51	71	2.52	-.40	1.39	9	2	T	T	12.2	S	52	W	27	10	8	12	5.8	61	158
New York CO	10	1006.4	-----	75	60	67.4	+.6	83	12	44	29	0	0	--	—	.73	-2.66	.27	7	0	.0	0	12.3	- -	42	SE	14	11	9	10	5.6	65	44
New York	19	1016.5	1018.2	77	61	68.6	—	85	16	45	30	0	0	56	67	1.01	-----	.26	7	1	.0	0	12.3	S	35	NW	26	9	9	12	5.9	--	38
Oswego	292	1004.1	1016.3	69	53	60.9	-.6	88	13	39	30	0	0			3.18	+.47	1.22	11	2	T	T	8.5	- -	28	NW	28	11	10	9	5.2	60	162
Rochester	543	997.6	1016.9	73	51	61.6	-.8	94	13	34	30	2	0	51	74	2.26	-.19	1.11	11	1	T	T	9.8	SSW	42	W	27	8	12	10	5.4	65	150
Syracuse	399	995.3	1017.2	72	51	61.6	+1.3	89	13	35	30	0	0	52	74	3.17	+.45	1.07	11	4	T	T	9.2	SSW	40	S	6	8	11	11	6.0	55	145
NORTH CAROLINA																																	
Asheville CO	2203	------	----	79	57	68.3	+3.3	92	1	44	29	1	0			3.55	+.51	1.11	9	6	.0	0	6.2	---	24	NW	1	8	15	7	5.1	67	19
Asheville	2093	945.8	1018.3	--	--	----	----	---		-	-	-	-	59	83	----	----	----	--	--	---	-	4.0	NNW	--	---	--				-	--	---
Charlotte	753	990.5	1017.9	82	62	72.2	+1.8	97	3	50	30	4	0	62	75	4.31	+1.32	1.80	8	5	.0	0	5.6	NE	19	S	6	8	12	10	5.6	73	9
Greensboro	891	987.5	1019.0	82	59	70.3	+.5	91	3	40	30	3	0	60	75	1.66	-1.59	.96	8	1	.0	0	6.5	SW	20	N	7	11	8	11	5.6	72	20
Hatteras	4	1017.3	1017.9	80	70	75.1	+.6	87	3	60	29	0	0	69	82	4.40	-.21	1.47	10	3	.0	0	9.5	NNE	29	NW	23	8	8	14	6.0	66	0
Raleigh CO	400	------	------	83	62	72.7	+1.6	94	3	44	30	3	0	--	--	.91	-2.70	.34	9	2	.0	0	4.9	---	18	S	23	9	10	11	5.8	54	9
Raleigh	438	1002.7	1018.5	83	60	71.5	----	95	3	39	30	4	0	61	77	1.38	-----	.81	7	2	.0	0	6.0	NE	--	---	--	9	10	11	5.7	—	15
Wilmington	30	1011.2	1017.8	84	66	75.0	+1.9	93	2	55	9	3	0	67	--	5.89	+1.38	2.26	9	2	.0	0	4.8	NE	27	NW	6	6	13	11	6.1	49	1
Winston-Salem	967	983.7	1018.7	82	61	71.2	+.5	95	3	42	29	3	0	58	68	1.35	-1.75	.69	8	1	.0	0	8.0	NE	--		--	11	12	7	5.0	--	18
NORTH DAKOTA																																	
Bismarck	1653	953.9	1014.3	66	43	54.5	-2.8	83	18	19	28	0	5	45	76	.76	-.47	.19	11	3	.0	0	9.1	WNW	38	NW	13	4	10	16	6.9	46	310
Devils Lake CO	1471	959.7	1013.2	62	43	52.5	-3.4	80	30	25	24	0	3			1.54	-.09	.60	13	0	T	T	8.1	-	34	W	26	5	8	17	6.9	44	371
Fargo	895	979.0	1013.0	65	44	54.6	-3.6	85	18	25	24	0	4	45	76	.79	-1.43	.37	8	0	.0	0	11.7	WNW	45	NW	26	4	8	18	7.3	39	302
Williston CO	1877	946.8	1014.6	63	43	53.1	-3.5	82	18	27	27	0	5	44	76	2.80	+1.71	1.96	7	1	T	T	7.8	---	33	W	26	5	4	21	7.4	--	351
OHIO																																	
Akron	1210	980.0	1018.2	72	49	60.6	3.7	85	13	35	29	0	0	52	75	3.07	-.26	1.52	8	3	.0	0	8.2	S	---	---	--	10	7	13	5.7	-	155
Cincinnati Obs.	761	------	------	79	55	66.8	-.3	92	1	38	29	2	0	--	--	2.68	+.03	.95	9	2	.0	0	5.2	--	17	SW	10	--	--	--	---	65	55
Cincinnati	871	985.8	1017.7	78	54	65.9	----	93	--	38	29	0	0	53	67	2.21	-----	.78	7	0	.0	0	8.2	S	--	--	-	12	10	8	4.8	--	72
Cleveland CO	----	------	------	72	56	63.8	.1	87	12	43	30	0	0	-	--	3.53	+.20	1.25	6	--	.0	0	----	---	---	---	--	-	-	-	---	--	90
Cleveland	787	989.8	1017.5	74	52	62.9	-.9	87	12	37	29	0	0	53	73	4.49	+1.16	1.66	7	1	.0	0	10.0	S	37	W	27	12	8	10	5.4	65	107
Columbus CO	724	------	-----	76	56	66.2	-.3	88	12	37	29	0	0			3.07	+.50	1.04	5	2	.0	0	----	---	---	---	--	--	--	-	---	---	62
Columbus	815	988.2	1017.8	77	52	64.4	-.4	89	12	33	29	0	0	53	69	3.00	+.13	.92	7	2	.0	0	6.9	SSE	29	SW	10	11	8	11	5.3	64	94
Dayton	1002	981.7	1017.9	75	53	63.9	-2.0	88	12	34	29	0	0	52	70	2.53	-.38	.76	6	2	.0	0	9.5	S	41	SW	27	10	9	11	5.7	64	96
Sandusky	603	994.9	- - --	74	54	64.1	-1.2	91	12	44	28	1	0			1.95	-1.01	.54	8	1	.0	0	7.5	---	26	W	27	14	8	8	4.5	81	89
Toledo	621	994.2	1017.4	74	51	62.0	-1.1	91	12	34	29	1	0	52	74	2.07	-.73	.53	8	1	.0	0	9.9	SSW	35	SW	27	10	9	11	5.6	49	123
Youngstown	1178	975.3	1017.7	72	49	60.7	-2.6	86	13	37	30	0	0	51	74	3.27	+.39	1.67	10	2	.0	0	8.2	S	*40	WNW	13	9	11	10	5.6	--	154
OKLAHOMA																																	
Oklahoma City CO	1254	------	-----	--	--	----	----	---	--	--	--	---	-	-	-	--		-- --	--	-	---	-	----	---	---	---	--	--	-	--	---	--	23
Oklahoma City	1254	968.8	1014.9	85	61	72.9	+.1	104	2	47	22	7	0	59	69	3.11	+.06	1.32	7	4	T	T	14.7	S	45	N	21	15	9	6	4.0	68	16
Tulsa	672	991.2	1015.3	82	60	71.2	-1.7	100	2	49	22	4	0	61	76	5.83	+2.78	2.67	10	11	T	0	10.9	S	36	NW	9	14	8	8	4.5	69	16
OREGON																																	
Baker	3369	-----	------	--	--	----	----	---	--	-	-	-	-	36	--	----	-----	-- -	--	-	---	-	6.6	NNW	---	---	--	--	--	--	---	--	---
Baker CO	3446	895.7	1016.0	76	43	59.6	+3.6	90	16	30	26	1	1	-		.06	-.68	.09	1	0	.0	0	6.4	---	23	N	20	17	10	3	3.4	86	179
Burns CO	4140	873.7	1014.9	79	42	60.6	+5.0	91	16	26	26	2	1	32	37	.50	-.37	.70	2	0	.0	0	---	---	---	---	--	22	4	4	2.7	--	152
Eugene	364	1001.4	1015.0	80	46	62.7	----	95	13	33	26	4	0	48	66	1.22	-----	.68	5	0	.0	0	7.2	N	---	---	--	17	4	9	4.2	--	89
Meacham	4050	877.4	1016.7	71	45	58.3	----	86	15	33	27	0	0	35	46	1.73	-----	1.45	3	0	.0	0	5.4	ESE	---	---	--	12	9	9	4.8	--	213
Medford	1314	966.5	1013.5	87	49	67.8	+4.3	99	9	43	26	10	0	44	19	.22	-.43	.22	1	0	.0	0	4.0	S	*25	NW	27	20	4	6	2.8	--	24
Pendleton	1489	961.4	1014.6	78	51	64.8	+3.0	89	17	36	27	0	0	43	46	.44	-.45	.08	2	1	.0	0	8.1	SE	---	---	--	18	6	6	3.5	--	69
Portland CO	30	--- -	------	77	55	66.1	+4.4	92	14	47	26	4	0	-	--	2.89	+.91	1.15	7	0	.0	0	----	---	---	---	--	--	--	--	---	--	47
Portland	21	1009.1	1014.8	76	50	63.1	+2.7	91	14	39	26	1	0	51	70	2.55	- - -	.98	7	0	.0	0	5.4	NW	26	SW	25	13	6	11	5.1	67	90
Roseburg CO	479	996.3	1014.6	82	51	66.6	+3.7	96	13	46	27	7	0	--	-	1.03	-.24	.96	4	0	.0	0	[illegible]	---	21	W	27	14	9	7	4.4	74	25
Salem	195	1007.5	1014.7	78	47	62.7	+1.3	96	13	36	26	4	0	49	69	3.22	+1.59	1.86	7	0	.0	0	6.1	S	--	---	--	11	8	11	5.1	--	96
Sexton Summit CO	3836	---	------	75	54	64.4	----	88	9	41	11	0	0	--	--	1.22	----	1.12	3	0	.0	0	----	---	---	---	--	20	2	8	3.0	--	103
Troutdale	29	-----	------	78	51	64.4	----	91	18	37	26	5	0	--	-	3.27	—	1.02	6	0	.0	0	----	---	---	---	--	14	5	11	5.1		81
PENNSYLVANIA																																	
Allentown	381	1004.7	1018.7	75	53	63.9	-.9	86	1	33	30	0	0	55	76	2.46	.94	1.17	8	5	.0	0	6.0	NW	---	- -	--	7	13	10	5.7	-	81
Curwensville	2215	------	------	70	46	58.0	---	83	13	31	29	0	2	51	79	3.68	-- --	1.25	12	4	.0	0	9.1	WNW	*22	WNW	7	8	10	12	6.1	--	222
Erie CO	655	------	------	71	56	63.6	.0	87	13	42	30	0	0	--	--	2.95	-.44	1.22	11	2	.0	0	7.9	---	28	SW	27	12	8	10	5.0	62	102
Harrisburg	335	1004.1	1018.0	77	56	66.3	+.5	90	1	37	30	1	0	54	70	2.40	-.65	1.36	8	5	0	0	6.8	WNW	29	NW	28	9	11	10	5.5	69	55
Park Place	1932	------	------	69	52	60.4	----	80	1	34	29	0	0	-	--	4.23	------	1.50	12	1	.0	0	----	---	---	---	--	8	9	13	5.8	--	155
Philadelphia CO	26	------	------	78	61	69.4	+1.4	88	1	45	29	0	0	--	-	1.39	-1.75	.79	6	0	.0	0	6.7	-	20	NW	7	9	12	9	5.8	69	24
Philadelphia	13	1014.2	1018.0	79	57	68.3	+2.4	89	12	40	29	0	0	57	69	1.73	-1.41	.67	5	0	.0	0	7.9	S	30	W	7	11	9	10	5.3	--	36
Pittsburgh CO	749	------	------	76	56	65.8	-.3	89	13	41	30	0	0	-	--	3.08	+.50	.74	-	--	.0	0	----	---	---	--	--	--	--	-	---	48	70
Pittsburgh	1248	987.8	1018.2	75	54	64.5	-.2	90	13	41	*28	1	0	52	67	2.71	+.13	1.24	11	3	.0	0	9.6	SSE	*29	SE	1	6	16	8	5.8	66	84
Reading CO	266	1006.1	1018.0	77	57	67.2	+.6	88	1	37	30	0	0		-	2.87	-.34	1.67	8	1	.0	0	8.9	---	33	NW	28	12	8	10	5.4	61	50
Scranton CO	746	989.2	1018.0	73	52	62.4	-.5	86	12	32	30	0	0	-	-	1.80	-1.37	.65	8	1	.0	0	5.3	—	25	NW	28	11	10	9	5.4	51	114
Williamsport	527	999.0	1017.9	75	52	63.5	-.9	87	12	32	30	0	1	53	74	1.88	-1.40	1.22	10	3	.0	0	7.5	WNW	*59	SSE	6	8	12	10	5.8	--	94
RHODE ISLAND																																	
Block Island	110	1013.9	1018.1	72	59	65.3	+1.9	78	15	43	30	0	0	--	—	1.28	-1.38	.64	5	0	.0	0	---	---	---	---	--	12	8	10	5.3	--	53
Providence CO	12	------	------	76	56	65.8	+2.6	86	13	35	30	0	0	--	--	1.70	-1.48	.67	6	1	.0	0	---	---	---	---	--	--	--	--	--	—	71
Providence	55	1012.2	1018.2	74	54	64.0	+2.5	87	12	32	30	0	1	55	75	1.74	-1.44	.73	6	2	.0	0	7.4	SSW	24	SW	14	10	10	10	5.4	71	89

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind		Fastest mile			No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1015.2	---	82	71	76.4	-0.2	89	7	64	9	0	0	--	--	8.07	+3.54	3.48	12	7	.0	0	9.0	---	29	NE	1	5	10	15	6.8	51	0
Charleston	41	1015.6	1017.3	84	66	75.0	+.8	91	7	57	25	3	0	69	86	4.28	-.85	1.40	12	7	.0	0	5.4	NE	---	---	---	3	10	17	7.3	--	0
Columbia CO	332	1004.7	---	85	67	75.5	+1.0	95	4	56	29	7	0	--	--	3.02	-.43	1.22	11	4	.0	0	---	---	29	E	2	6	9	15	6.4	54	4
Columbia	217	1009.1	1017.4	86	65	75.5	---	97	4	53	9	10	0	65	77	4.70	---	2.27	11	4	.0	0	5.1	NE	---	---	---	8	9	13	6.2	--	2
Florence	146	1006.4	1017.6	84	65	74.3	---	92	3	53	°9	5	0	66	80	3.81	---	1.57	11	3	.0	0	5.8	SE	---	---	---	5	10	15	6.9	--	2
Greenville	1006	980.7	1017.5	82	64	73.2	+2.6	95	3	53	29	8	0	62	73	8.85	+5.17	6.20	8	4	.0	0	5.8	NNE	31	SE	6	8	10	12	6.1	66	3
Spartanburg	801	988.8	1018.2	82	63	72.6	+.5	95	3	52	29	8	0	62	75	8.36	+4.90	3.69	8	4	.0	0	6.0	SW	•30	SW	29	8	11	11	5.9	--	5
SOUTH DAKOTA																																	
Huron	1282	967.2	1014.4	69	44	56.3	-5.0	83	18	20	28	0	1	46	72	.70	-.87	.36	5	0	.0	0	11.1	NW	64	NW	26	6	10	14	6.2	63	260
Rapid City	3215	902.1	1015.8	69	43	55.8	-4.4	87	30	25	28	0	3	42	66	1.46	+.26	.41	9	6	T	T	11.2	NNW	49	NW	1	8	11	11	5.7	53	274
Sioux Falls	1420	964.1	1015.4	68	44	56.1	-6.2	83	11	24	28	0	4	47	76	2.40	+.74	1.01	8	3	.0	0	9.6	WNW	•35	NW	26	7	9	14	6.6	--	266
TENNESSEE																																	
Bristol	1519	964.8	1018.6	79	56	67.7	-3.6	88	2	41	29	0	0	58	77	2.94	+.22	.92	10	6	.0	0	4.5	NE	---	---	---	12	9	9	5.0	--	37
Chattanooga	670	990.5	1017.7	85	62	73.4	+5.2	100	1	50	29	6	0	63	76	5.57	+2.46	1.22	8	7	.0	0	4.2	NE	46	W	6	11	9	10	5.3	59	3
Knoxville	949	983.1	1017.8	83	61	71.9	+2.5	100	1	46	29	6	0	61	75	4.37	+1.69	1.62	12	4	.0	0	4.6	NE	39	NW	6	12	11	7	5.0	53	9
Memphis CO	---	---	---	81	64	72.6	-1.0	96	1	47	29	4	0	--	--	4.36	+1.56	2.18	6	--	.0	0	---	---	---	---	---	---	---	---	---	---	10
Memphis	263	1002.7	1017.3	84	61	72.7	+.8	102	1	46	29	9	0	62	72	4.02	+1.12	1.65	6	4	.0	0	9.1	NNE	35	NW	10	13	9	8	4.4	76	10
Nashville	577	997.6	1017.5	83	60	71.6	-.2	99	1	42	29	6	0	60	72	2.92	-.50	.95	8	6	.0	0	5.1	N	31	NW	24	12	8	10	5.0	59	17
TEXAS																																	
Abilene	1752	953.3	1013.0	91	65	78.1	+4.3	104	1	46	17	20	0	56	55	.83	-1.87	.75	5	4	.0	0	11.0	S	40	S	3	17	8	5	3.4	77	10
Amarillo	3590	889.6	1013.0	85	55	70.0	+2.2	97	3	39	16	11	0	50	59	2.01	-.29	1.95	3	3	.0	0	13.4	S	38	NE	27	21	5	4	2.9	75	52
Austin	515	993.2	1014.5	90	69	79.2	+.9	103	1	56	19	14	0	68	77	6.45	+3.05	2.27	9	4	.0	0	7.9	S	38	E	25	13	8	9	4.8	75	0
Big Spring	2533	926.2	1013.4	90	64	77.1	+1.4	103	1	48	17	19	0	53	51	.79	-1.36	.42	4	5	.0	0	15.3	S	--	---	---	21	8	1	2.5	--	6
Brownsville	16	1010.2	1012.5	90	74	82.3	+1.7	95	2	64	17	19	0	73	81	4.97	-.85	2.86	9	8	.0	0	9.9	SE	32	SE	12	10	14	6	4.9	70	0
Corpus Christi	40	1012.9	1013.7	90	74	81.9	+3.3	97	1	64	17	13	0	74	84	14.54	+10.05	6.00	10	9	.0	0	10.3	SE	31	S	12	15	6	9	4.4	64	0
Dallas	487	996.3	1013.1	89	68	78.8	+1.4	105	2	51	17	16	0	63	66	3.81	+1.09	2.46	5	3	.0	0	9.5	SSE	41	NW	9	15	11	4	3.5	83	0
Del Rio	957	980.0	1013.7	94	72	82.8	+3.6	105	1	53	17	23	0	64	61	1.73	-1.24	1.70	3	3	.0	0	9.7	ESE	31	E	23	16	7	7	3.8	82	0
El Paso	3920	880.8	1009.6	92	64	77.9	+5.6	99	2	56	18	22	0	45	36	.04	-1.21	.04	1	2	.0	0	7.7	SSE	38	NW	29	24	5	1	1.3	92	0
Fort Worth	688	990.9	1014.9	91	68	79.4	+3.5	107	2	54	17	19	0	61	63	1.84	-.65	.80	7	5	.0	0	13.2	S	•42	W	9	18	9	3	3.3	--	0
Galveston CO	7	---	---	85	75	80.1	.0	93	1	66	17	3	0	--	--	11.64	+6.07	2.84	17	--	.0	0	10.5	---	34	SE	11	--	--	--	--	54	0
Galveston	7	1014.2	1014.8	86	74	79.8	-.3	93	1	67	17	3	0	74	83	12.63	+7.06	3.20	19	17	.0	0	11.1	SSE	---	---	---	5	14	11	6.1	--	0
Houston CO	41	1009.8	---	88	72	80.1	+1.1	99	3	62	17	13	0	--	--	4.83	+.75	.84	14	9	.0	0	8.4	---	33	SE	12	6	13	11	6.3	63	0
Houston	41	1012.2	1014.7	86	71	79.6	+1.7	98	1	63	17	12	0	71	84	5.40	+1.45	1.70	14	12	.0	0	10.3	SSE	--	---	---	5	14	11	6.2	--	0
Laredo	500	997.6	1012.4	94	71	83.7	+1.5	104	1	60	17	23	0	70	72	8.62	+5.34	4.12	8	4	.0	0	14.0	SE	37	SE	11	13	12	5	4.2	--	0
Lubbock	3238	903.2	1012.8	86	58	72.1	+.8	100	2	42	17	13	0	51	57	.70	-2.20	.38	5	5	.0	0	12.0	S	•35	SSW	11	19	6	5	2.9	--	29
Palestine CO	491	997.3	1014.9	88	69	78.2	+1.2	103	2	58	29	10	0	--	--	4.26	+1.35	2.52	9	8	.0	0	6.7	---	32	SE	25	11	12	7	4.9	73	0
Port Arthur CO	5	1013.2	---	87	72	79.5	.0	96	2	62	17	7	0	--	--	13.52	+8.71	3.40	15	16	.0	0	10.4	---	49	S	13	7	10	13	6.1	50	0
Port Arthur	5	1013.9	1014.6	87	69	78.3	---	97	1	61	19	10	0	71	88	13.45	---	5.31	16	16	.0	0	8.1	NE	---	---	---	6	11	13	6.4	--	0
San Angelo	1903	947.2	1013.2	90	66	78.1	+2.3	103	26	45	17	20	0	57	54	1.26	-1.67	.92	3	3	.0	0	11.2	S	•31	SSE	23	19	9	2	3.0	--	5
San Antonio	782	989.5	1014.0	91	70	80.5	+1.5	102	1	56	18	17	0	67	72	3.75	+.70	2.54	8	6	.0	0	8.2	SE	34	NE	4	13	9	8	4.7	70	0
Victoria	109	1009.5	1013.9	90	73	81.5	+.8	102	1	63	17	15	0	71	81	8.48	+4.87	4.79	13	11	.0	0	6.7	SSE	•34	NNE	10	8	11	11	5.9	--	0
Waco	504	995.9	1014.1	90	69	79.7	+.7	105	1	54	18	15	0	65	68	3.60	+.66	1.92	9	8	.0	0	11.5	S	---	---	---	15	7	8	4.5	--	0
Wichita Falls	1027	977.7	1013.6	91	65	77.6	-.5	107	1	49	16	18	0	58	57	1.18	-1.64	.65	4	3	.0	0	11.7	SSE	•35	ENE	7	22	4	4	2.8	--	11
UTAH																																	
Milford	5029	846.9	1013.9	84	44	64.1	+3.0	91	10	29	22	5	1	30	31	.48	+.08	.48	1	1	.0	0	7.8	SSW	---	---	---	25	5	0	1.4	--	67
Salt Lake City CO	4260	---	---	--	--	---	---	---	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	---	---	---	--	--	--	---	--	40
Salt Lake City	4222	866.9	1012.6	80	49	64.6	+1.9	90	5	38	22	1	0	37	40	T	-.98	T	0	1	.0	0	6.9	SSE	34	E	28	21	8	1	2.2	91	64
VERMONT																																	
Burlington	398	1002.0	1014.9	70	50	59.9	-.4	85	12	29	30	0	1	51	80	4.10	+.62	2.25	12	1	.0	0	10.2	SSW	38	S	27	7	9	14	6.2	48	187
VIRGINIA																																	
Cape Henry	16	1017.3	1018.0	78	68	72.8	+1.0	85	2	58	29	0	0	--	--	1.34	-1.52	.69	8	2	.0	0	10.7	---	34	N	7	12	9	9	4.7	77	5
Lynchburg	947	985.1	1018.6	80	58	68.9	+1.0	93	1	39	30	3	0	57	70	1.56	-1.75	.70	6	3	.0	0	7.5	S	25	SW	13	9	13	8	5.2	65	33
Norfolk CO	11	1015.2	1018.5	80	66	73.2	+1.6	92	2	54	29	3	0	--	--	.53	-2.70	.19	7	1	.0	0	8.0	---	23	NE	29	--	--	--	---	58	8
Norfolk	25	1017.3	1018.5	79	63	71.3	+1.8	90	°1	47	30	2	0	63	77	.98	-2.25	.59	9	1	.0	0	7.9	S	---	---	---	9	10	11	5.8	--	13
Richmond CO	162	---	---	81	60	70.5	.0	91	2	43	30	2	0	--	--	1.97	-1.28	.87	7	--	.0	0	---	---	---	---	---	--	--	--	---	--	17
Richmond	160	1012.5	1018.4	81	59	70.0	+1.0	93	2	40	30	3	0	60	76	.98	---	.38	6	3	.0	0	6.6	S	29	N	28	9	9	12	5.4	65	22
Roanoke	1192	977.0	1018.6	80	56	68.1	-.3	94	2	36	30	3	0	55	69	1.84	-1.36	.63	6	4	.0	0	4.0	SE	---	---	---	10	10	10	5.3	--	38
Washington CO	72	---	---	80	61	70.6	+2.5	91	1	45	°29	2	0	--	--	1.91	-1.33	.95	6	2	.0	0	6.2	---	26	NW	28	--	--	--	---	74	22
Wash. Nat'l. AP	14	1014.2	1018.5	80	61	70.3	+2.2	90	1	44	29	2	0	58	69	2.67	-.57	1.21	6	1	.0	0	8.3	S	32	S	14	10	11	9	5.0	60	22
WASHINGTON																																	
Ellensburg	1727	953.6	1015.4	76	45	60.4	+2.4	89	18	34	27	0	0	45	59	.36	-.15	.15	5	1	.0	0	8.1	NW	---	---	---	15	8	7	4.0	--	148
Kelso	17	---	---	74	48	60.9		89	1	35	26	0	0	--	--	1.85	---	.57	7	0	.0	0	---	---	---	---	---	10	10	10	5.3	--	128
North Head CO	194	1007.8	1015.2	60	52	55.9	-.6	89	13	49	20	0	0	--	--	4.11	+1.12	1.99	10	0	.0	0	13.0	---	46	S	29	5	6	19	7.4	30	273
Olympia	190	1008.1	1015.4	73	46	59.2	---	90	14	38	21	1	0	50	77	2.83	---	1.09	7	0	.0	0	3.7	SSW	---	---	---	12	10	8	5.1	--	177
Port Angeles	11	1015.2	1016.1	60	48	54.3	---	72	4	44	26	0	0	49	85	1.10	---	.49	7	0	.0	0	10.0	W	---	---	---	9	7	14	6.0	--	315
Seattle	14	1014.2	1015.5	--	--	---	---	---	--	--	--	--	-	51	72	---	---	---	--	--	---	-	7.4	NNW	---	---	---	--	--	--	---	--	---
Seattle CO	14	---	---	71	53	61.9	+1.6	89	14	48	26	0	0	--	--	2.03	+.26	.67	9	0	.0	0	7.7	---	36	S	7	10	9	11	5.4	54	110
Spokane	2357	946.5	1015.3	73	47	60.2	+1.0	86	6	32	26	0	1	39	48	.47	-.43	.25	6	1	.0	0	7.2	NE	34	SW	25	15	6	9	4.5	63	163
Stampede Pass CO	3960	879.8	1017.9	63	46	54.1	---	78	17	32	26	0	1	--	--	5.06	---	1.69	9	2	.0	0	11.8	---	41	W	25	16	6	8	4.2	--	324
Stevenson CO	319	---	---	75	54	64.2	---	89	16	43	26	0	0	--	--	3.95	---	2.59	6	0	.0	0	---	---	---	---	---	15	3	12	4.6	--	79
Tacoma CO	127	1008.5	1015.2	69	52	60.2	+2.9	83	15	45	26	0	0	--	--	2.03	-.06	1.05	8	0	.0	0	5.2	---	34	SW	25	9	11	10	5.4	53	148
Tatoosh CO	101	1012.5	1015.9	58	48	52.8	-.2	76	14	45	20	0	0	50	91	4.76	+.08	1.99	10	0	.0	0	12.4	S	46	S	28	5	5	20	7.6	27	358
Walla Walla	1200	---	---	--	--	---	---	---	--	--	--	--	-	42	--	---	---	---	--	--	---	-	6.8	E	---	---	---	--	--	--	---	--	---
Walla Walla CO	949	978.7	1014.2	79	54	66.7	+2.9	91	18	41	27	3	0	--	--	.74	-.21	.86	3	0	.0	0	5.0	---	31	W	25	18	6	6	3.6	73	39
Yakima	1061	975.6	1014.4	80	44	61.6	-.2	93	17	29	26	2	2	43	55	.19	-.36	.12	3	0	.0	0	7.4	W	---	---	---	16	6	8	4.0	--	125
Seattle-Tacoma AP	379	1001.4	1015.8	70	49	59.1	---	87	15	40	26	0	0	50	76	2.03	---	.96	9	0	.0	0	9.0	NNE	---	---	---	11	9	10	5.3	--	185
WEST VIRGINIA																																	
Charleston	950	983.1	1018.4	79	55	66.7	---	90	1	34	29	1	0	57	77	4.66	---	1.58	11	2	.0	0	6.5	S	•25	W	7	7	13	10	5.8	--	59
Elkins	1969	950.6	1019.1	74	48	61.1	-.8	87	1	27	29	0	2	53	81	2.47	-.68	1.62	9	4	.0	0	3.8	NW	23	NW	28	3	16	11	6.6	55	148
Huntington	565	---	---	82	56	68.7	+2.7	94	1	37	29	2	0	--	--	1.52	-1.08	.75	7	--	.0	0	---	---	---	---	---	--	--	--	---	--	39
Parkersburg CO	615	---	---	78	54	66.3	-1.0	92	1	34	29	1	0	--	--	2.55	-.21	1.89	7	2	.0	0	5.2	---	19	S	10	10	10	10	5.5	66	68
Parkersburg	837	--	1017.9	--	--	---	---	---	--	--	--	--	-	56	--	---	---	---	--	--	---	-	6.6	SSW	---	---	---	--	--	--	---	--	--
Petersburg	1013	981.7	---	81	51	66.0	---	96	1	28	29	3	2	--	--	.90	---	.45	4	2	.0	0	---	---	---	---	---	9	12	9	5.6	--	71
WISCONSIN																																	
Green Bay	689	992.2	1014.8	67	46	56.7	-3.7	85	12	29	29	0	2	49	83	2.93	-.59	1.03	12	2	.0	0	10.3	SW	66	W	27	7	11	12	6.5	53	257
La Crosse CO	---	---	---	--	--	---	---	---	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	---	---	---	--	--	--	---	--	198
La Crosse	669	990.2	1014.7	68	49	58.4	-3.0	84	11	33	29	0	0	50	78	3.17	-.82	1.92	11	7	.0	0	10.0	S	•28	W	27	7	6	17	7.1	--	208
Madison CO	---	---	---	--	--	---	---	---	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	---	---	---	--	--	--	---	--	201
Madison	857	984.4	1015.9	70	48	58.8	-2.6	84	11	32	29	0	1	50	77	2.56	-1.16	1.18	12	5	.0	0	11.4	S	43	SW	27	9	8	13	6.1	61	201
Milwaukee CO	---	---	---	--	--	---	---	---	--	--	--	--	-	--	--	---	---	---	--	--	---	-	---	---	---	---	---	--	--	--	---	--	150
Milwaukee	674	991.2	1015.5	69	51	59.7	-1.3	87	12	36	29	0	0	50	76	2.75	-.54	1.46	12	4	.0	0	11.8	SW	45	SE	26	8	10	12	6.2	66	181

See footnotes at end of table.

Table 2—Continued

State and station		Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)					
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
	Elevation (ground)	Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M p. h.			0–3	4–7	8–10	0–10	%	
WYOMING																																	
Casper	5322	838.1	1014.4	70	40	55.3	-3.9	85	10	23	27	0	4	34	52	1.12	-0.03	0.35	11	7	0.3	T	9.8	SW	—	—	—	12	9	9	5.0	—	283
Cheyenne	6139	813.1	1014.5	70	40	54.6	-2.4	84	[illegible]	25	27	0	[illegible]	36	56	.75	-.45	.54	7	4	T	T	12.4	[illegible]	36	[illegible]	26	14	7	9	4.7	68	306
Lander	5563	836.1	1015.5	71	40	55.4	-.3	85	10	27	27	0	5	33	49	1.06	+.14	.42	4	2	T	T	6.9	---	43	NW	18	11	11	8	4.6	69	279
Rock Springs	6741	796.1	1015.9	72	40	55.9	-.8	80	10	26	12	0	3	28	39	.05	-.55	.05	1	3	.0	0	13.0	W	*43	NW	18	11	14	5	4.2	—	267
Sheridan	3942	884.9	1016.6	67	40	53.5	-2.8	86	10	26	28	0	4	40	63	3.08	+1.81	.97	11	7	.3	T	8.8	NW	43	NW	10	9	12	9	5.6	64	336
PACIFIC AREA																																	
Canton Island	9	1009.1	1009.7	93	79	85.8	----	97	[illegible]	75	23	28	0	75	78	.77	-----	.22	11	0	.0	0	----	---	---	---	---	3	25	2	4.9	—	0
Hilo	28	1012.9	1014.1	84	68	76.1	----	92	21	64	2	1	0	67	77	2.40	-----	.87	18	0	.0	0	5.4	SW	24	SW	21	7	14	9	5.6	57	0
Honolulu CO	12	------	------	83	74	78.7	+.5	86	16	71	27	0	0	--	-	.87	-.41	.35	9	0	.0	0	----	---	---	---	---	---	---	---	---	---	0
Honolulu	7	1014.2	1014.9	86	74	79.7	----	88	16	69	20	0	0	68	70	.91	-----	.37	9	0	.0	0	10.1	ENE	26	S	21	11	16	3	4.4	72	0
Lihue	115	1009.5	1014.7	84	72	77.8	----	86	15	66	14	0	0	71	80	4.34	-----	1.92	20	2	.0	0	8.3	NE	26	E	1	6	15	9	5.9	60	0
Wake Island	9	1013.2	1013.6	88	78	83.0	----	90	9	75	3	1	0	76	78	4.18	-----	.75	18	0	.0	0	11.8	ENE	---	---	---	10	16	[illegible]	4.9	---	0
Koror	117	1004.7	1008.5	87	75	81.2	----	90	10	73	2	4	0	--	--	8.58	-----	2.21	24	0	.0	0	---	---	---	---	---	---	---	---	---	---	0
Ponape	109	1006.4	1011.4	88	74	80.9	----	92	29	71	4	9	0	--	--	10.60	-----	2.11	20	3	.0	0	---	---	---	---	---	---	---	---	---	---	0
Yap Island	51	1008.1	1010.0	89	76	82.4	----	92	23	72	19	13	0	-	--	12.58	-----	5.87	25	3	.0	0	---	---	---	---	---	---	---	---	---	---	0
Koror (August)	117	1004.7	1008.4	87	75	80.9	----	91	18	71	27	4	0	--	--	20.50	-----	4.16	23	3	.0	0	---	---	---	---	---	---	---	---	---	---	0
Ponape (August)	109	1007.1	1012.0	87	73	80.1	----	91	3	70	9	8	0	--	--	22.14	-----	3.00	26	3	.0	0	---	---	---	---	---	---	---	---	---	---	0
PUERTO RICO																																	
San Juan CO	47	------	------	87	76	81.2	+.7	93	9	73	3	3	0	-	--	9.05	+3.14	1.58	23	16	.0	0	---	---	---	---	---	---	---	---	---	---	0
San Juan	9	1011.5	1013.6	87	75	81.3	----	93	7	72	22	8	0	74	82	9.19	-----	1.32	23	16	.0	0	7.2	S	31	S	2	1	14	15	7.1	50	0
ALASKA																																	
Anchorage	134	1003.7	1008.8	54	40	47.3	-.7	64	23	31	24	0	3	44	84	5.16	+2.45	1.79	20	0	.0	0	5.1	N	47	S	11	1	4	25	9.0	13	527
Annette Island	110	1011.3	1014.9	60	47	53.7	-.1	73	15	39	25	1	0	48	82	5.64	-3.95	1.51	14	0	.0	0	10.7	SE	*50	SE	8	5	6	19	7.5	--	332
Barrow	22	1014.9	1015.2	34	31	32.5	+1.7	39	10	24	30	0	19	31	92	.55	+.01	.14	15	0	1.2	T	13.1	SE	28	E	21	0	0	30	10.0	--	969
Bethel	21	1004.4	1006.1	51	39	45.2	-.1	63	2	28	28	0	3	41	85	3.47	+.46	.96	18	0	T	0	9.6	S	*29	SSE	20	2	5	23	8.4	--	588
Cordova	40	1007.8	1009.8	56	42	49.2	+1.1	65	23	32	24	0	1	46	86	27.72	+10.29	7.92	24	0	.0	0	4.5	E	*38	ESE	14	2	3	25	8.9	--	473
Fairbanks	436	992.2	1009.1	56	38	46.9	+2.9	72	2	25	24	3	9	38	70	.72	-.25	T	5	0	T	0	4.9	N	*23	SW	11	2	5	23	8.2	--	538
Galena	94	1003.4	1008.1	51	37	43.7	+.7	67	3	19	29	0	6	39	80	3.01	+1.40	1.25	14	0	T	0	8.1	NNE	*38	SW	11	1	7	22	8.5	--	634
Gambell	25	1010.5	1011.5	41	35	38.0	-2.7	45	25	30	30	0	1	35	87	.58	-1.48	.25	8	0	1.2	1	17.1	NNE	---	--	--	1	5	24	8.6	--	802
Juneau	15	1018.5	1019.4	58	43	50.6	+2.0	70	1	27	26	1	2	44	76	3.85	-2.73	2.30	15	0	.0	0	5.5	E	26	SE	17	3	6	21	7.9	25	426
Kotzebue	10	1009.5	1010.2	48	36	41.6	+.9	58	13	25	27	0	9	37	81	.79	-.12	.27	11	0	.4	T	11.9	NE	---	---	—	6	5	19	7.2	--	698
McGrath	334	995.3	1007.8	52	36	44.3	+.2	66	3	17	29	0	10	39	80	2.99	+.59	.73	18	14	1.6	0	4.0	N	*32	SSW	20	3	4	23	8.2	--	616
Nome	13	1008.1	1008.8	50	36	42.8	+1.1	63	4	25	30	0	10	38	81	1.17	-1.54	T	10	0	!T	0	9.1	N	31	N	5	7	6	17	7.0	--	657
Northway	1713	944.8	1010.8	54	34	44.1	+1.6	69	4	19	24	0	13	35	72	.35	-.98	.27	5	0	1.3	1	2.9	NW	--	--	--	1	2	27	8.9	--	620
St. Paul Island	22	1008.5	1009.5	49	40	44.5	-.7	54	6	35	°19	0	0	43	91	1.86	-1.64	.47	15	0	!T	0	----	---	---	---	--	0	7	23	8.6	--	608
Umiat	337	1003.1	1015.9	39	29	34.1	+1.9	62	7	11	29	0	20	31	90	.86	+.48	.25	11	0	T	T	7.9	ENE	*23	E	25	0	3	27	9.5	--	919
Wales	9	1010.2	1011.2	42	37	39.5	-1.1	47	12	32	°6	0	3	--	--	.26	-.11	.08	5	0	T	T	----	---	---	---	--	0	1	29	9.2	--	758
Yakutat	28	1011.5	1012.9	57	44	50.0	+1.1	72	15	33	24	1	0	48	88	15.84	+.01	4.05	19	0	.0	0	7.6	E	*38	ESE	9	2	3	25	8.9	--	429

Note: Alaskan stations - a Max. Temp. of 70°F. or above in "No. of days" column.
Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
** Peak gust.
° Other dates also.
! Melted as it fell.

DEGREE DAYS

Table 3 (Base 65°F.) SEPTEMBER 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	2	2	6
Mobile (CO)	0	0	1
Mobile	0	0	
Montgomery (CO)	0	0	3
Montgomery	0	0	4
ARIZONA			
Flagstaff	203	298	340
Payson (CO)	5	23	
Phoenix (CO)	0	0	0
Phoenix	0	0	
Prescott	4	20	
Tucson	0	0	
Winslow	2	6	
Yuma	0	0	0
ARKANSAS			
Ft. Smith	8	8	12
Little Rock	6	6	11
Texarkana	0	0	
CALIFORNIA			
Bakersfield	0	0	2
Beaumont (CO)	8	14	
Bishop	10	11	41
Blue Canyon	55	142	
Burbank	0	2	
Eureka (CO)	289	854	824
Fresno	0	0	5
Los Angeles (CO)	0	1	7
Los Angeles	0	4	
Mt. Shasta (CO)	62	126	
Oakland	65	238	220
Red Bluff	2	2	12
Sacramento (CO)	3	6	18
Sacramento	3	4	
Sandberg (CO)	17	41	
San Diego	1	1	17
San Francisco (CO)	172	670	505
San Francisco	102	399	372
Santa Catalina	53	157	
Santa Maria	79	283	
COLORADO			
Alamosa	304	379	
Colorado Springs	183	227	
Denver	139	168	141
Grand Junction	36	36	60
Pueblo	115	121	93
CONNECTICUT			
Bridgeport	63	64	
Hartford	101	106	125
New Haven	72	75	102
DELAWARE			
Wilmington	45	47	
DIST. OF COLUMBIA			
Washington (CO)	22	22	45
Washington	22	22	
FLORIDA			
Apalachicola	0	0	0
Daytona Beach	0	0	
Fort Myers	0	0	0
Jacksonville (CO)	0	0	0
Jacksonville	0	0	
Key West (CO)	0	0	0
Key West	0	0	
Melbourne	0	0	
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	
Miami Beach	0	0	
Orlando	0	0	
Pensacola (CO)	0	0	1
Tallahassee	0	0	
Tampa	0	0	0
West Palm Beach	0	0	
GEORGIA			
Albany	0	0	2
Atlanta (CO)	3	3	12
Atlanta	3	3	
Athens	3	3	
Augusta	0	0	4
Columbus	0	0	
Macon	0	0	5
Rome	3	3	
Savannah	0	0	1
Valdosta	0	0	
IDAHO			
Boise	88	112	162
Lewiston	77	114	
Pocatello	147	190	209
ILLINOIS			
Cairo (CO)	24	24	25
Chicago (CO)			102
Chicago	114	118	
Joliet	152	165	
Moline	130	137	
Peoria	119	122	93
Springfield (CO)	71	71	67
Springfield	101	101	
INDIANA			
Evansville	55	56	38
Ft. Wayne	140	156	128
Indianapolis (CO)	69	69	71
Indianapolis	112	113	
South Bend	157	183	
Terre Haute	108	108	

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
IOWA			
Burlington	125	127	85
Charles City (CO)	215	249	196
Davenport (CO)	105	105	99
Des Moines	147	154	112
Dubuque	206	242	143
Keokuk (CO)			75
Sioux City	195	217	142
KANSAS			
Concordia (CO)	113	113	70
Dodge City	96	100	63
Goodland	154	184	97
Topeka (CO)	84	84	59
Topeka	91	91	
Wichita	59	59	42
KENTUCKY			
Lexington	54	54	55
Louisville (CO)	38	38	39
Louisville	45	45	
LOUISIANA			
Baton Rouge	0	0	2
Lake Charles	0	0	
New Orleans (CO)	0	0	1
New Orleans	0	0	
Shreveport	0	0	4
MAINE			
Caribou	314	499	
Eastport	200	374	567
Greenville (CO)			497
Portland	195	236	258
MARYLAND			
Baltimore (CO)	23	23	36
Baltimore	39	39	
Frederick	43	46	
MASSACHUSETTS			
Boston	65	68	120
Nantucket	60	64	121
Pittsfield	241	333	
MICHIGAN			
Alpena (CO)	265	394	361
Detroit	116	131	144
Escanaba (CO)	284	448	396
Grand Rapids (CO)	144	157	156
Grand Rapids	188	228	
Lansing	190	232	220
Marquette (CO)	319	555	441
Muskegon	205	265	
Sault Ste. Marie	363	645	402
Ypsilanti	137	152	
MINNESOTA			
Duluth (CO)			446
Duluth	415	683	
International Falls	428	677	
Minneapolis	242	266	197
Rochester	244	294	
St. Cloud	318	387	323
St. Paul	235	259	202
MISSISSIPPI			
Jackson	0	0	5
Meridian	0	0	5
Vicksburg	0	0	6
MISSOURI			
Columbia	80	84	66
Kansas City	68	69	53
St. Joseph	94	96	67
St. Louis (CO)	42	42	39
St. Louis	56	57	
Springfield	69	69	54
MONTANA			
Billings	312	411	
Butte	480	843	
Glasgow (CO)	343	431	
Great Falls	368	565	
Havre (CO)	349	467	352
Helena	388	556	400
Kalispell	383	599	500
Miles City	335	400	
Missoula	306	456	370
NEBRASKA			
Grand Island	188	208	
Lincoln (CO)	120	124	91
Lincoln	148	157	
Norfolk	200	226	
North Platte	198	244	143
Omaha	128	134	98
Scottsbluff	212	455	
Valentine (CO)	249	321	192
NEVADA			
Elko	175	246	
Ely	214	266	
Las Vegas	0	0	
Reno	92	144	172
Winnemucca	131	178	225
NEW HAMPSHIRE			
Concord	198	254	255
Mt. Washington	720	1796	
NEW JERSEY			
Atlantic City	29	30	42
Newark	48	48	72
Trenton	45	46	69

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
NEW MEXICO			
Albuquerque	3	3	25
Clayton	94	103	42
Raton	151	167	
Roswell	17	17	26
NEW YORK			
Albany	172	190	149
Bear Mountain (CO)	151	180	
Binghamton	194	278	203
Buffalo	158	186	174
New York (CO)	44	44	55
La Guardia Field	38	38	
Oswego	162	202	200
Rochester	150	185	169
Syracuse	145	186	193
NORTH CAROLINA			
Asheville (CO)	19	19	51
Asheville	19	19	
Charlotte	9	9	19
Greensboro	20	20	33
Hatteras	0	0	1
Raleigh (CO)	9	9	21
Raleigh	15	15	
Wilmington (CO)	1	1	5
Winston-Salem	18	18	
NORTH DAKOTA			
Bismarck	310	410	307
Devils Lake (CO)	371	506	407
Fargo	302	393	307
Grand Forks			366
Williston (CO)	351	470	370
OHIO			
Akron	155	193	141
Cincinnati (CO)	33	33	57
Cincinnati	72	72	
Cleveland (CO)	90	103	114
Cleveland	107	121	
Columbus	94	102	76
Dayton	96	97	87
Sandusky (CO)	89	92	93
Toledo	123	144	128
Youngstown	154	192	
OKLAHOMA			
Oklahoma City (CO)	23	26	22
Oklahoma City	16	18	
Tulsa	16	16	
OREGON			
Baker (CO)	179	294	385
Burns (CO)	152	226	
Eugene	89	147	
Meacham	213	416	
Medford	24	50	112
Pendleton	69	95	
Portland (CO)	47	89	159
Portland	90	148	
Roseburg (CO)	25	53	162
Salem	96	168	
Sexton Summit (CO)	103	255	
Troutdale	81	153	
PENNSYLVANIA			
Allentown	81	94	
Curwensville	222	335	
Erie (CO)	102	119	125
Harrisburg	55	60	78
Park Place	155	211	
Philadelphia (CO)	24	24	38
Philadelphia	36	36	
Pittsburgh (CO)	70	74	77
Pittsburgh	84	99	108
Reading (CO)	50	50	67
Scranton (CO)	114	138	144
Williamsport	94	107	113
RHODE ISLAND			
Block Island	53	54	99
Providence (CO)	71	73	121
Providence	89	95	
SOUTH CAROLINA			
Charleston (CO)	0	0	1
Charleston	0	0	
Columbia (CO)	4	4	6
Columbia	2	2	
Florence	2	2	
Greenville	3	3	16
Spartanburg	5	5	
SOUTH DAKOTA			
Huron	260	305	189
Pierre			151
Rapid City	274	345	231
Sioux Falls	266	306	
TENNESSEE			
Bristol	37	37	
Chattanooga	3	3	13
Knoxville	9	9	21
Memphis	10	10	15
Nashville	17	17	20
TEXAS			
Abilene	10	10	10
Amarillo	52	52	45
Austin	0	0	2
Big Spring	6	6	11
Brownsville	0	0	0
Corpus Christi	0	0	0

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
TEXAS (Cont'd.)			
Dallas	0	0	5
Del Rio (CO)	0	0	1
El Paso	0	0	6
Ft. Worth	0	0	5
Galveston (CO)	0	0	0
Galveston	0	0	
Houston (CO)	0	0	
Houston	0	0	1
Laredo	0	0	
Lubbock	29	29	
Palestine (CO)	0	0	4
Port Arthur (CO)	0	0	1
Port Arthur	0	0	
San Angelo	5	5	
San Antonio	0	0	1
Victoria	0	0	
Waco	0	0	
Wichita Falls	11	11	
UTAH			
Milford	67	68	
Salt Lake City (CO)	40	40	102
Salt Lake City	64	65	88
VERMONT			
Burlington	187	240	262
VIRGINIA			
Cape Henry	5	5	8
Lynchburg	33	33	43
Norfolk (CO)	8	8	9
Norfolk	13	13	
Richmond (CO)	17	17	28
Richmond	22	22	
Roanoke	38	38	50
WASHINGTON			
Ellensburg	148	221	
Kelso	128	286	
North Head (CO)	273	693	673
Olympia	177	237	
Port Angeles	315	833	
Seattle (CO)	110	190	232
Spokane	163	245	242
Stampede Pass (CO)	324	878	
Stevenson (CO)	79	159	
Tacoma (CO)	148	255	336
Tatoosh Island (CO)	358	973	922
Walla Walla (CO)	39	55	104
Yakima	125	177	153
WEST VIRGINIA			
Charleston	59	62	
Elkins	148	204	159
Huntington	39	39	
Parkersburg (CO)	68	71	66
Petersburg	71	82	
WISCONSIN			
Green Bay	257	363	234
La Crosse (CO)	198	223	186
La Crosse	208	232	
Madison (CO)	201	227	176
Madison	201	250	
Milwaukee (CO)	150	183	159
Milwaukee	181	225	
WYOMING			
Casper	283	351	
Cheyenne	306	428	329
Lander	279	356	334
Rock Springs	267	358	
Sheridan	336	421	
ALASKA			
Anchorage	527	973	
Annette Island	332	748	
Barrow	969	2260	2655
Bethel	588	1320	1323
Cordova	473	1123	
Fairbanks	538	906	1128
Galena	634	1214	
Gambell	802	2060	
Juneau	426	861	
Kotzebue	698	1584	
McGrath	616	1133	
Nome	657	1691	1658
Northway	620	1075	
St. Paul	608	1653	
Umiat	919	3097	
Wales	758	2905	
Yakutat	429	1063	

Data from airport unless otherwise specified. CO indicates data from city office.

Table 4

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Zanesville and Adamsville area, Muskingum County, Ohio	1	12:30 a.m.	*3 to 5	18			$50,000	Slight	Wind, rain, and electrical	Violent electrical storm accompanied by high wind and heavy rain caused damage to trees and telephone and electric lines; barn leveled in fire at Adamsville.
Indiana, Pa.	1	Early morning							Wind	Trees blown down and a number of roofs damaged by wind during thunderstorm.
Dunbar and vicinity, W. Va.	1	4:45-6 a.m.					6,000		Electrical and rain	Heavy rains damaged exhibits at the West Virginia Agricultural and Industrial Fair, mostly by water leaking through grandstand seats.
Osage County, Kans.	1	7 a.m.					1,400		Electrical	Lightning struck and destroyed barn and 60 tons of hay on farm near Scranton.
Whitewater, Mont.	1	1 p.m.	*2-3	20				$19,000	Hail	Damage mostly to wheat.
Rosebud, Mont.	1	2 p.m.	*5				5,000	50,000	do	Damage mostly to alfalfa seed. Grain and hay also damaged.
Bloomfield, Mont.	1	2 p.m.	*4	9				Considerable	do	Damage to wheat about $5 per acre; 50 percent damage to flax; some damage to corn.
Garland, Mont.	1	2 p.m.	*12					Severe	do	Damage to wheat and alfalfa seed.
Montauk Point, N. Y.	1	2:30 p.m.			45		See remarks		Wind	With a strong northeast wind, the boat *Pelican* carrying 64 persons was caught in a rip tide with 1 of her 2 motors dead. Many passengers rushed to the lee side and the overloaded craft capsized, drowning 45 persons.
Nebraska, southern portion of panhandle	1	4 p.m.-midnight							Hail and rain	Many cattle cut and bruised; gardens a total loss; some winter wheat had to be reseeded. Main crop of winter wheat had already been harvested, and acreage of late crops very small. Several strips affected by heavy hail.
Montgomery County, Tenn.	1	Afternoon	*1	5			100,000	See remarks	do	Storm occurred in tobacco area just before cutting time. Damage averaged from 50 percent on edge of storm to complete loss in worst part. Heavy rain in area about midnight of same day.
Willard, Mont.	1	4:30 p.m.	*1½					4,000	Hail	
Murfreesboro to Lascassas, Tenn.	1	Late afternoon							Wind and hail	Some damage to small buildings. Limbs blown from trees. Electric power disrupted for 15 minutes.
Gatlinburg to Mt. LeConte, Tenn.	1	Late afternoon					10,000	Some	Rain	Four inches of rain within an hour on Mt. LeConte, with even more falling on slopes below. Many motorists trapped in Smokies when highway at Chimney picnic area and at Cole Creek washed out. Wall of water 15 feet high moved down river beds below. Several people miraculously escaped drowning. An automobile washed from street in front of Gatlinburg hotel and was washed several miles down stream. Tourist cabins damaged. Some damage to crops in creek and river bottoms.
Waynesville (7 miles northwest of), Haywood County, N.C.	1	5-6:30 p.m.	*3	5			14,800	600	Rain and hail	Most damage due to flooding of small mountain creeks, from heavy local thunderstorms. Main damage to highways and bridges.
Brady, Mont.	1	6 p.m.	*2	60			Some	Severe	Hail	Hailstones 3/4 to 1 inch in diameter. Some wheat fields damaged 100 percent.
Fort Benton, Mont.	1			50			Some	90,000	Hail and wind	Wheat damaged 10 to 50 percent. Wind damage $200 to property.
Carlisle-Harrisburg-Lebanon area, Pa.	1-2	Evening, 1st-afternoon, 2d			1	5			Rain	Heavy rains inundated streets, fields, and highways. Near Palmyra, water over highway rose to door handles of stalled cars, and near Mechanicsburg it was 6 inches deep on highways. In New Cumberland rains undermined newly filled sewer ditches, causing street cave-ins. One person killed and 5 injured in auto collision during heavy rain west of Camp Hill. Minor interruptions to power service in some areas. Lebanon cooperative observer recorded 7 inches of rain between 3:30 a.m. and 8 p.m. on 2d. Grantville reported 6.09 inches between 1 a.m. and 4 p.m. on 2d.
Rooks County, Kans.	1	Night					2,825		Electrical	Lightning struck and killed 8 head of cattle on 2 farms about 6 miles southeast of Plainville.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Milan, Tenn.	1	During night					$2,500	See remarks	Electrical, wind, and hail	Some damage to crops, power lines, and outbuildings. One barn struck by lightning and burned, with stored feed.
Dundy County (north-central to southeast), Nebr.	1-2	Near midnight	*8	40			Some	$125,000	Hail	
Southeastern Chase and southwestern Hayes Counties, Nebr.	1-2	Near midnight	Several miles	20			Considerable	Heavy	do	Corn and sorghum crops ruined in main path, and considerable property damage in Hamlet.
Anderson County, Kans.	2	10:30 a.m.					$2,500		Electrical	Barn and contents (hay, harness, and 3 hogs) northwest of Garnett burned after being struck by lightning.
Labette County, Kans.	2	2 p.m.					1,150		do	Barn and contents (40 tons of hay) 5 miles northwest of Oswego burned after being struck by lightning
McAlester, Pittsburg County, Okla.	2	Afternoon			1				do	Boy, playing under a tree in his front yard, killed by lightning. He was knocked out of his shoes by the bolt.
Winnfield, La.	2	4:15 p.m.	100	½	0	0	25,000		Tornado	Several homes, an auto, and a school bus damaged. Lumber yard damaged. Power lines severed.
Cheyenne County, Kans.	2	Evening						See remarks	Hail and rain	Hail caused heavy destruction to corn and feed crops west of St. Francis near Colorado line. Downpours of rain damaged summer-fallowed ground over a more extensive area in western Cheyenne County.
Lincoln County, Kans.	2	Night					600		Electrical	Barn and contents (cow, calf, 2 tons of hay) 6 miles southeast of Lincoln burned, following lightning strike.
Bayard to Northport, Nebr.	2	11:45 p.m.	*2	15			110,000	250,000	Hail and rain	Area struck was intensely farmed under irrigation; beans ruined, and potatoes and sugar beets severely damaged.
McPherson County, Kans.	3	5:52 a.m.					20,000		Electrical	Fire caused by lightning practically destroyed 2 large breakers at McPherson city power plant, cutting off electrical power in city for several hours.
Shawnee County, Kans.	3	7:10 a.m.					1,500		do	Tower of school building in Topeka badly damaged by fire caused by lightning. Minor damage to home in Topeka which was struck during same storm.
Putnam, Callahan County, Tex.	3	4:30 p.m.					1,500		Wind	Damaged one house, one barn, and some utility highline poles.
Sanford, Fla.	3	Late afternoon					1,000		Electrical	Lightning struck church and damaged steeple and roof.
Laurel, Miss.	3	Late p.m.					25,000	10,000	Wind	Thundersquall shattered plate glass windows, uprooted trees, blew down corn and cotton, severed power line and unroofed garages and sheds.
Stigler (east of), Haskell County, Okla.	3-4	10 p.m.-3 a.m.					10,000		Electrical and wind	Two barns burned when struck by lighting, with damage of $10,000. Slight wind damage to another barn.
Meade County, Kans.	4	4 p.m.					12,000	See remarks	Wind, hail, and electrical	Wind blew roof off main hangar, wrecked private hangar, and damaged 7 planes at Meade Muncipal Airport. Hail damaged gardens in town, and lightning burned out at least 3 transformers. Estimated damage listed was by wind.
Colorado Springs, Colo.	4	4:45-5:30 p.m.	*10	20			750,000	400,000	Hail	Storm occurred north of city to Peterson Field; stone 1½ to 2 3/8 inches in diameter. Crops damaged were beans, corn, sorghums, and winter wheat. Greatest property damage to roofs, windows, greenhouses, and automobiles.
Byers, Colo.	4	5:30-5:55 p.m.	*2½	10			80,000	10,000	do	Storm in Strosbury-Byers area; stones 1½ to 2½ inches in diameter. Some crop damage. Greatest losses to buildings and automobiles.
Ellis County, Kans.	4	Night					800		Electrical	Prize bull killed by lightning near Hays.
Sartell and vicinity, Minn.	5	3 p.m.					10,000	15,000	Hail	Heavy hail that accompanied a severe thunderstorm caused considerable damage to growing crops, grains in shock, trees, and property. Hail unusually

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										numerous. Some hailstones exceptionally large. One of the largest hailstones ever reported in State fell in village of Sartell. It measured about 9½ inches in circumference and weighed about 2 pounds. Some fields of growing crops a total loss. Many windows broken in Sartell and vicinity where greatest damage occurred.
Forest Lake (vicinity of), Minn.	5	3 p.m.		2			$5,000	See remarks	Wind	Thunderstorm moved northeastward over narrow path. Small farm buildings demolished; barns damaged and grain shocks scattered; communication and power lines disrupted; boat overturned on Forest Lake No. 2 and two persons narrowly escaped drowning.
Holyoke and vicinity, Minn.	5	5:15 p.m.					2,000	$5,000	Hail	Moderate to heavy hail accompanied a sever thunderstorm, causing considerable damage to growing crops, grains in shock, trees, and property. Hail numerous and varied in size, some being 3/4 inch in diameter. Storm moved southeastward.
Coos and Grafton Counties, N.H.	6-7	3-11 p.m. 6th; intermittent, 7th							Hail, wind, and rain	Winds during thunderstorms blew down trees; electric lines damaged in some places. Hail up to 1 inch in diameter.
Oxford, Somerset, Kennebec and northern Waldo Counties, Me.	6-7	4 p.m., 6th-4 p.m., 7th (intervals)							do	Squall winds during thunderstorms blew down trees; electric lines damaged in some places. Hail 1 inch in diameter at Unity; marble-size other places.
Laramie County (eastern portion), Wyo.	6	6-10 p.m.	•8	40			125,000	50,000	Hail and rain	All crops in path of storm either damaged or destroyed. Livestock, buildings, and autos damaged by hail. Railroads and highways damaged by flood waters.
Ottawa County, Kans.	9	Early a.m.					2,500		Electrical	Seven cows and 1 calf killed on farm near Delphos. Just northwest of Minneapolis farmer lost a heifer and another a Black Angus cow during severe electrical storm.
Washington County, Kans.	9	Morning					350		do	Lightning killed a horse on each of 2 farms in Barnes community.
Miami (3 miles north of), Ottawa County, Okla.	9				1		See remarks		do	Child killed when struck by lightning in his home. Home set on fire, with minor property damage.
Custer County (especially Butler and west Burnitz Creek areas), Okla.	9	3:30-4:30 p.m.	•3	40			11,000	150,000	Hail	Stones up to size of baseballs. Cotton heavily damaged. Roofs damaged. Window panes broken. Some sheep and poultry killed.
Vinita (south of), Craig County and Cleora, Delaware County, Okla.	9	4:20 p.m. at Cleora	67	1	0	0	3,000	1,000	Tornado and rain	Path eastward. Funnel observed. Minor damage to trees near Ironside schoolhouse in southeastern Craig County, then it lifted and came to ground near Cleora lifting a church building off ground. Accompanied by heavy rain; at Vinita, 4.11 inches of rain fell between 4 and 7 p.m.
Tulsa, Okla.	9	4:30-5:13 p.m.					500		Rain and electrical	Lightning started 3 minor fires. Some homes flooded. Many minor traffic accidents. Damage unusually light considering intensity of storm.
Columbus, Miss.	10	9:15 a.m.	100	••100	0	0	30,000		Tornado	Struck edge of town and damaged 1 block. Wall of motor company blown out. Roofs damaged. Windows shattered.
Kremlin, Mont.	10		•½-2	20				Light	Hail	
Dupuyer, Mont.	11	3-4 p.m.	•5	8-9				Light	do	Damage mostly to grass pasture.
Montgomery (several miles east of City limits), Ala.	11	P.m.					15,000		Electrical	Fire caused by lightning gutted night club; building a "total loss".
Texas County (southern portion), Mo.	11	Evening					500	500	Wind and rain	As much as 5 percent of standing crops in some areas laid down by wind. Telephone services disrupted for several days.
Clay County, Kans.	11	Night	•2	4			500	650	Hail and wind	Hail, with stones up to 1 1/4 inches in diameter, caused damage to windows, roofs, row crops, and livestock in area 5 miles west and 2 north of Clay Center. Further south, wind and light hail caused lesser damage. Estimated damage was by hail.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Ottawa County, Kans.	12	1:20 a.m.					$500		Wind (tornadic)	Wind with characteristics of a small tornado unroofed 1 home and upset small building in Minneapolis.
Sumner County, Kans.	12	8 a.m.			1		1,500		Electrical	Woman died from shock and effects of smoke and fumes caused when lightning struck the home, which was severely damaged.
Northern Pepin and Dunn Counties, Wisc.	12	11:30 a.m.	200	30	0	2	127,000	Small	Tornado	Most destruction occurred in rural area 6 miles east of Menomonie. At least 8 barns demolished. Other farm buildings demolished or badly damaged. Many trees uprooted.
Wisconsin, most of State	12	Daytime					100,000	Small	Electrical, wind, and rain	Trees blown down and power and communication lines disrupted in some areas of State. About 1,300 phones and 100 long distance lines temporarily out of service. At least 1 barn struck by lightning and burned. Flash floods caused some damage in city of Bayfield.
Whitetail, Mont.	13	3 p.m.	•5					Light	Hail	Up to 16 percent damage to wheat.
Montgomery, Ala.	13	P.m.					2,500		Thunderstorm	Basements flooded by heavy rainfall. One family had to evacuate its home. Boy rescued from a culvert after falling into swollen waters.
Milford area, Lassen County, Calif.	17	P.m.							Electrical and rain	Heavy rain in Milford area. On one ranch, yard level raised 2 feet by a coat of silt; mud in kitchen; creek bed filled even; rocks, boulders, and logs swept past house and on below into meadow land. On another ranch fences washed out; rocks and boulders filled the garden spot; new mowing machine was half buried; marks below open windows showed the narrow escape from flood waters. Between the 2 ranches on following morning the road crew was busy clearing a 70-yard swath of soil, 4 feet deep; and bulldozing out 1/4 to 1/2 ton boulders. On highway 395 travel halted to allow for clearing of long mud wash. Near Herlong Junction barn set aflame by a direct lightning hit and burned to ground. Lightning strikes set 24 fires in timber, the largest about 15 acres.
Hennepin, Ramsey, and Washington Counties, Minn.	20	5:27 p.m.		35			10,000		Wind	Thunderstorm moved northeastward, accompanied by heavy rains and hail. Outbuildings and silo on a farm south of St. Paul Park wrecked; several hogs killed; several plate glass windows blown in; homes damaged; power and communication lines disrupted; some trees uprooted; automobile damaged by falling tree.
Hennepin, Ramsey, and Washington Counties, Minn.	20	5:27 p.m.	•2	35		1	50,000	$10,000	Hail and rain	Moderate to heavy hail, that accompanied sever thunderstorm, caused much damage to property and considerable damage to growing crops. Hailstones unusually numerous in Lake Phalen and Hazel Park districts (northeast and east St. Paul) where it accumulated up to 4 inches in spots, with some hailstones measuring 1½ inches in diameter. Leaves of trees stripped, and some fields of late truck a total loss. Many windows broken, roofs and sidings of homes damaged, and automobile tops punctured. Storm moved northeastward. Heavy rains accompanied storm.
Wilson County, Kans.	21	Night					500		Electrical	Young registered Hereford bull killed by lightning near Fredonia.
Saline County, Kans.	23	Morning				1			do	Man seriously injured when struck by lightning, while on tractor near Carlton.
Morris County, Kans.	23	11:10 a.m.					500		do	School building in Council Grove struck by lightning. Chimney and roof damaged.
Coffee County, Kans.	23						800		do	Two cows and 2 steers killed by lightning on farm northeast of Waverly.
Osage County, Kans.	23	Afternoon			1				do	Man killed near Burlingame when struck by lightning, while drilling wheat.
Rush County, Kans.	23	9:30 p.m.	100	3/4	0	0	400		Tornado	Storm moved eastward 4 miles northeast of McCracken. It damaged buildings and twisted large trees out of ground in manner to definitely indicate rotary winds, although darkness prevented funnel cloud being observed.
Kingman, Sumner, and Cowley Counties, Kans.	23	Night		75			3,600		Hail, wind, and electrical	Widespread thunderstorms accompanied by hail, lightning and wind in some localities. Chimney of school in Winfield struck by lightning. House near Winfield struck, causing hole in side and some fire damage. Lightning also produced a fire which

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										destroyed chicken house and 350 chickens near Pretty Prairie, in Kingman County, and barn and contents of hay near Arkansas City, in Cowley County. Power lines damaged by wind and lightning over a large area in Sumner and Cowley Counties, and buildings on farm near Winfield destroyed by wind. Hail in Wellington seriously damaged windows, greenhouses, neon signs, and automobiles. Damage by hail, $1,000; wind, $1,000; lightning, $1,600.
McPherson County, Kans.	24	1:20 a.m.	*1	5			$75,000	$2,500	Hail	Heavy hail, with stones up to 3 inches in diameter, struck McPherson, particularly southern part of town, causing heavy damage to neon signs, greenhouses, roofs, street lights, and automobiles.
Labette County, Kans.	24	6:45 a.m.					See remarks		Electrical	Extensive lightning damage to power line caused about one-half of Parsons to be without electricity for an hour.
Montgomery County, Kans.	24	7:30 a.m.					4,000		do	Home and contents destroyed by lightning-caused fire 3½ miles southwest of Cherryvale.
Montgomery, Ala.	24	6:45 p.m.					250,000		Electrical and rain	A cloudburst of record or near-record proportions snarled traffic, flooded homes, apartments, and some business establishments, temporarily marooned scores of house or trailer dwellers, and otherwise caused widespread damage. Cloudburst was accompanied by vivid flashes of lightning which struck 2 transformers, disrupting electric services in several sections of city; also affected about 500 telephones; 2 cables out of service. Water also damaged numerous automobiles either parked in low places or stalled in flooded streets.
Albany, Ga.	24	8:30 p.m.				1	800		Electrical	Lightning struck a home and nearby oak tree. Most of damage resulted from limbs or pieces of tree being hurled through 2 windows of home, substantially damaging house furnishings and causing painful injury to 1 person. The thunderstorm was moving from the south-southwest over an area 3 to 5 miles wide.
Pontchatoula, La.	25	Late afternoon			2				do	Two men struck by lightning, while gathering cucumbers in field.
Illinois, northern third	26	Midnight-6 a.m.					15,000		Electrical and rain	Severe thunderstorms caused considerable damage due to excessive precipitation in Quad-City area. Two houses severely damaged by lightning and one barn and its contents completely burned. Another barn destroyed by a lightning strike near Hoopeston and another near Lincoln.
Bettendorf, Iowa	26	12:25-6:02 a.m.					5,000		Rain, electrical, and hail	Lightning struck a home ruining roof and 1 bedroom. No fire resulted. Size of hail near 3/8 inch.
Wisconsin, most of State	26	P.m.					200,000		Wind	Southwesterly and westerly gales with gusts above 50 m.p.h. Many trees blown down, power and communication lines disrupted, and some buildings damaged. Piers and docks in several Lake Michigan harbors damaged by waves, due in part to high level of Lake Michigan this year.
Cambria (near), Columbia County, Wisc.	26	4:30 p.m.	100	10	1	10	°225,000	°	Tornado	A house and several modern farm barns totally demolished. Many trees uprooted. The twister pulled trees 18 inches in diameter out by roots.
Waupaca County, Wisc.	26	3:50 p.m.	100	20	6	3	°250,000	°	do	Buildings on several farms demolished or badly damaged. Greater part of destruction occurred 3 miles north of City of Waupaca. Five of the six people killed were members of one family.
Montgomery County, Kans.	26	7:30 p.m.					2,000		Electrical	Unoccupied tenant house and 500 bales of hay and 200 bushels of grain, 6 miles southeast of Cherryvale, burned after being struck by lightning.
Biteley, Mich.	26	Late evening		2	1	3	See remarks		Tornado	Concrete wall of tavern blown down. Steel I-beams carried 100 yards.
Michigan	26, 27						See remarks	See remarks	Winds	High winds for 2 days reduced apple harvest, amounting to thousands of dollars in loss. Prolonged winds sent pounding waters against lake shore properties along Lake Michigan and Lake Huron, which were already at a very high level. Frankfort, Detour, Escanaba, and western Lake Huron shores especially hard hit.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Hooper, Montgomery County, Ark.	27	4 a.m.			1		See remarks		Electrical and wind	Man killed by lightning while enroute from his house to storm cellar. Several barns unroofed and small buildings damaged by wind. Estimated monetary loss not available
Glenwood, Ark.	27	4:15 a.m.					$3,000	$2,000	Wind	Trees blown over, houses and barns unroofed, and windows blown out in town of Glenwood. Damage to cotton and corn standing in fields. Storm moved southeastward.
Harvey, Jefferson Parish, La.	27	10:30 a.m.	20	1	0	0	30,000		Tornado	Tornado developed over Mississippi River and moved westward; men standing a few yards away not injured. Unroofed packing plant, with roof crushing several automobiles.
Mauch Chunk-New Tripoli area, Pa.	27	6-7:30 p.m.							Rain and hail	New Tripoli reported 0.91 inch of rain in 30 minutes. Local flooding from rain, and power out locally from thunderstorm. Mauch Chunk reported hail as big as walnuts, and heavy rains flooded streets and cellars.
Sanford and vicinity, Fla.	28						Minor	100,000	Rain	Observer at Sanford measured 5.02 inches of rain that fell between 5:30 a.m. and 9:30 p.m. and reported that 2 other gages located on farms within a radius of about 3 miles indicated 4.58 and 5.03 inches for this day. Major portion of damage due to washing out newly-planted crops.
Whiteriver, Ariz.	29	4:55 a.m.	880				°5,000	°	Hail	Heavy hail accompanied thunderstorm. Stones ranged from ½ to 1 inch in diameter. Extensive damage to shade trees, garden crops, and apples which were ready to harvest.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

SEPTEMBER 1951

Floods again visited the area of the Midwest which only two months ago experienced one of the most disastrous floods of record. The Saline River in Kansas approached within 0.9 foot of the record July stage of 30.2 feet. Severe floods were also reported along the Marais des Cygnes in Kansas, and along the Floyd River in Iowa. It was the third severe flood of the year along the latter stream. Light to moderate flooding was reported along several other streams in the Missouri Basin. It was the first time in 76 years of record that the Missouri River at Kansas City, Mo., had reached bankfull level in September.

ATLANTIC SLOPE DRAINAGE.—There were no significant rises in the Atlantic Slope drainage during September. Stream flow in general was low and an all-time record low stage of 1.6 feet was established on the Pee Dee River at Peedee, S. C., on the 5th. At Effingham, S. C., the river approached within 0.2 foot of the lowest stage recorded in 1899.

EAST GULF OF MEXICO DRAINAGE.—A new record low stage of -0.8 foot was reported on the Conecuh River at Brewton, Ala., on the 4th. The previous low stage at Brewton was -0.4 foot on November 18, 1941.

MISSOURI BASIN.—Heavy rain (2.5 to 3 inches) on the 8th and 9th caused severe flooding along the lower Floyd River between the 9th and 16th. The runoff was heavy as the soil was well saturated from the unusually heavy rains of the preceding summer months. During August the rainfall ranged from about 5 inches near the Iowa-Minnesota line up to about 12 inches in the vicinity of Merrill, Iowa. This was the third severe flood on this stream this year. At James, Iowa, the Floyd crested at a stage of 19.9 feet in March, 20 feet in July, and 20 feet again this month. These are the highest stages recorded at James since this gage was installed in 1934. Flood damage to crops during this flood was relatively small due to the previous severe flood in July.

Severe flooding occurred along the Marais des Cygnes and the lower portions of the Saline Basin. Crests on the Marais des Cygnes were generally 5 to 10 feet below the record overflows in July. The lower Saline at Tescott, Kans., approached within 1 foot of the previous record stage. Light to moderate overflows occurred along the Kansas, Solomon, lower Smoky Hill, Delaware, Little Blue, and locally on the Republican and Big Blue Rivers. These overflows were due to recurring showers between the 1st and 5th. Daily amounts of rainfall were variable but generally ranged from 3/4 inch to occasionally more than 2 inches. The heaviest rainfall of 2 to 3 inches was reported on the 4th on the upper Marais des Cygnes and along the Kansas Basin across the lower portions of the principal Kansas tributaries. A heavy local downpour of 5.9 inches at Barnard, Kans., accumulated in the 36 hours ending on the evening of the 4th. Due to the severity of the flooding in July over the same areas which were affected in September, additional damages were largely due to the retardation or nullification of rehabilitation work which had been started. This was especially true along portions of the Marais des Cygnes River and the City of Ottawa, Kans.

Showers and thunderstorms during the first 6 days of the month caused flooding along the lower portion of the Kansas River, Stranger Creek, lower portion of the Blackwater River, Lamine River, lower portion of the Grand River, Osage River, and the Missouri River below the mouth of the Kansas River. It was the first time in 76 years of record that the Missouri River at Kansas City, Mo., had reached bankfull level in September. The average monthly river stage for that point during the month was 14.5 feet, which is the highest average September stage since the beginning of records in 1874. The previous high river stage of 18 feet and monthly average river stage of 13.5 feet occurred during the previous great flood year of 1903.

ARKANSAS BASIN.—Heavy rains on the 3d, 4th and 5th caused flooding along streams in the Arkansas Basin. Precipitation during that period averaged 4.2 inches in the Cottonwood Basin above Emporia, Kans., 3.3 inches over the Neosho Basin, and between 3 and 4 inches over the Ninnescah Basin. Moderate flooding occurred along several streams but it was minor in comparison to the great flood of July.

OHIO BASIN.—The only flooding reported in the Ohio Basin during the month was in the Tennessee Basin. These overflows were flash floods, resulting from 2 intense thunderstorms, about 20 miles apart, on the West Fork Little Pigeon River in Tennessee and on Jonathan Creek, in Haywood County, North Carolina. There were no floods along the main stem of the Tennessee River.

The storm on the West Fork Little Pigeon River was far more destructive. The center of this storm was in the vicinity of Mt. Le Conte, near Gatlinburg, Tenn. A tourist camp operator on top of Mt. Le Conte reported that rain in excess of 4 inches fell in about 1 hour. Indirect evidence indicates that even heavier amounts occurred in the area. Numerous earth slides occurred on the slopes of Mt. Le Conte. The stage at Gatlinburg was the highest recorded there in 25 years. Portions of Gatlinburg were 5 feet under water. Some cabins and some business places had from 2 inches to 2 feet of water above the floor level. The total losses resulting from this storm are estimated at about 1/4 million dollars. Most of the damages were to park roads and park facilities, such as foot bridges, parking areas, and trails.

The other storm occurred over Jonathan Creek about 7 miles northwest of Waynesville, N. C., and covered an area about 3 miles wide and 5 miles long. The rainfall in this area ranged from 4.85 to 6.5 inches between 5 p.m. and 6:10 p.m. on September 1. The damages from the flood are estimated at less than 15 thousand dollars.

WEST GULF OF MEXICO DRAINAGE.—Heavy rains over the middle portions of the Nueces River Basin on the 13th caused a rapid rise to slightly above flood stage at Three Rivers, Tex. The river rose from a stage of 1.3 feet on the morning of the 13th to 32.3 feet on the 14th and continued rising slowly until the afternoon of the 15th when it reached 37.2 feet. Heavy flow from the Frio and Altascosa Rivers which empty into the Nueces River a short distance above Three Rivers, Tex., was largely responsible for the high water in this stream.

Flooding along the Rio Grande was due to several days of heavy rain which began on the 12th in the Lower Rio Grande drainage basin. The rainfall amounts on the American side ranged from 3 inches to an unofficial amount of 11 inches at Weslaco, Tex. The rainfall amounts on the Mexican side that actually caused the flood are unknown. The peak flow in this flood was 65,500 cfs at Rio Grande City, Tex., crest stage 22.7 feet, 1.7 feet above flood.

Damage to crops was very small as most of the damage was to cotton fields that had already been picked 2 to 3 times. The estimated number of acres inundated above Mercedes to Rio Grande City is about 60,000. All of this inundated area is outside of levee protection and in the actual flood plain.

FLOOD STAGE DATA

Table 5 (All dates in September unless otherwise specified)

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			*Ft.*	
MISSISSIPPI SYSTEM Missouri Basin					
Floyd:					
Merrill, Iowa	12	9	13	13.9	11
James, Iowa	16	9	16	20.0	12
Saline:					
Wilson, Kans.	12	4	6	20.4	5
Tescott, Kans.	25	5	11	29.3 29.2	7 9
Solomon:					
Alton, Kans.	12	4 8	4 8	15.1 12.3	4 8
Kirwin, Kans.	13	5	5	13.4	5
Beloit, Kans.	20	5 10	8 11	27.0 21.9	6 10
Minneapolis, Kans.	26	5 9	5 10	28.0 29.1	5 10
Niles, Kans.	24	5	14	28.1 28.4 27.9	5 6 11
Smoky Hill:					
Salina, Kans.	20	5	5	20.3	5
Abilene, Kans.	22	5	14	23.3 24.1	11 6–7
Enterprise, Kans.	26	4	15	29.6 28.7	7 13
North Fork: Benkelman, Nebr.	5	2 4 6	3 4 7	5.9 6.0 7.5	2–3 4 7
Driftwood Creek: McCook, Nebr.	15	4 8	5 8	21.1 23.0	5 8
Prairie Dog Creek: Norton, Kans.	17	4	5	19.1	4
Republican:					
Cambridge, Nebr.	6	3 7	6 8	8.0 8.0	4 8
Orleans, Nebr.	9	4 9	5 9	10.8 10.7	5 9
Clay Center, Kans.	15	5 12	5 13	15.1 17.5	5 13
Little Blue:					
Endicott, Nebr.	9	12	13	12.3	12
Hanover, Kans.	14	13	13	15.0	13
Big Blue:					
Barnston, Nebr.	18	13	13	20.0	13
Blue Rapids, Kans.	20	4 13 15	5 14 15	21.3 23.9 21.8	5 13 15
Soldier Creek: Topeka, Kans.	25	4	6	26.7	5
Delaware: Valley Falls, Kans.	22	5	5	24.3	5
Stranger Creek: Tonganoxie, Kans.	23	3	7	26.9	6
Kansas:					
Manhattan, Kans.	17	4	15	20.6 18.7 19.9	5 10 13
Wamego, Kans.	16	4 14	6 14	17.5 16.3	5 14
Topeka, Kans.	21	4	6	24.8	5
Lecompton, Kans.	17	5	6	21.3	5
Lawrence, Kans.	18	5	6	21.8	6
Bonner Springs, Kans.	21	5	7	22.8	7
Grand: Brunswick, Mo.	12	5	19	16.4 15.1	7 16
Blackwater: Blue Lick, Mo.	25	5	9	28.8	7
Lamine: Clifton City, Mo.	15	10 13	11 14	23.0 22.0	11 14
Pottawatomie Creek: Garnett, Kans.	26	4	5	27.8	4
Marais des Cygnes:					
Quenemo, Kans.	30	3	7	35.8	5
Ottawa, Kans.	24	4	8	32.3	6
Osawatomie, Kans.	28	3	10	38.5	7
La Cygne, Kans.	25	4	15	31.2 31.0	7–8 9
Trading Post, Kans.	24	4	16	28.9 30.2 28.4	8 10 13

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			*Ft.*	
MISSISSIPPI SYSTEM (Cont'd.) Missouri Basin (Cont'd.)					
Osage:					
Osceola, Mo.	22	9	21	32.2	14
Warsaw, Mo.	31	9	22	37.5	14
Lakeside, Mo.	60	Aug. 30 26	24 27	63.4 60.0	15 26–27
St. Thomas, Mo.	23	10	22	29.6	16–17
Missouri:					
Kansas City, Mo.	22	6	7	22.5	6
Lexington, Mo.	22	4 10	8 17	24.7 23.2	7 15
Waverly, Mo.	18	4	18	21.8 21.0	7 16
Boonville, Mo.	21	6 12	9 17	22.7 22.0	8 15
Hermann, Mo.	21	Aug. 30 6	1 21	23.2 24.5 25.8	Aug. 30 10 14, 15
St. Charles, Mo.	25	7	21	29.0	15
Arkansas Basin					
Little Arkansas:					
Sedgwick, Kans.	18	24	24	20.4	24
Ripley, Kans.	12	25	25	12.3	25
Ninnescah: Belle Plaine, Kans.	18	6	7	22.0	7
Cottonwood: Emporia, Kans.	20	4	9	24.4	6
Neosho:					
Emporia, Kans.	22	4	7	27.0	5
Neosho Rapids, Kans.	22	4	8	26.5	5
Burlington, Kans.	27	4	10	32.3	7
Le Roy, Kans.	23	4 13	10 13	25.8 23.1	5,8 13
Iola, Kans.	15	4	14	19.1 20.0 18.0	5 10 13
Chanute, Kans.	20	5	15	27.6	10
Parsons, Kans.	24	9	17	26.7 26.9	10 13
Oswego, Kans.	17	6	17	24.7	14
WEST GULF OF MEXICO DRAINAGE					
Nueces: Three Rivers, Tex.	37	15	15	37.2	15
Rio Grande:					
Rio Grande City, Tex.	21	15	16	22.7	16
Mercedes, Tex.	21	17	18	21.4	18

* Provisional.

RADIOSONDE DATA

Average monthly values

Table 20

SEPTEMBER 1951

Standard pressure surface (mb.)	ALBANY, N. Y. (1007 MB.)				ALBUQUERQUE, N. MEX. (838 MB.)				ATLANTA, GA. (982 MB.)				BIG SPRING, TEX. (925 MB.)				BISMARCK, N. DAK. (955 MB.)				BOISE, IDAHO (913 MB.)				BROWNSVILLE, TEX. (1012 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	29	86	14.4	85	30	1,620	23.1	27	30	307	21.9	77	30	784	24.9	41	30	505	11.1	82	30	868	18.5	35	30	6	26.4	84
1,000	29	142	15.2	80	30	42			30	152			30	89			30	116			30	78			30	114	26.4	80
950	28	580	15.1	68	30	510			30	605	22.2	69	30	546			30	553			30	535			30	571	23.9	75
900	29	1,035	12.9	67	30	995			30	1,070	20.2	68	30	1,024	24.9	40	30	1,004	11.2		30	995	21.6	23	30	1,039	21.4	68
850	29	1,514	10.5	64	30	1,497			30	1,562	16.9	71	30	1,523	22.4	44	30	1,478	8.1	66	30	1,488	19.2	20	30	1,533	18.8	63
800	29	2,017	8.1	58	30	2,028	22.9	21	30	2,077	13.8	65	30	2,048	19.3	43	30	1,976	5.1	65	30	2,005	15.3	23	30	2,052	16.0	60
750	28	2,552	5.5	51	30	2,590	18.6	22	30	2,625	11.0	57	30	2,602	15.1	45	30	2,510	2.4	62	30	2,553	11.1	26	29	2,604	13.4	57
700	28	3,108	3.1	43	30	3,172	13.6	25	30	3,192	7.7	56	30	3,180	11.0	41	30	3,056	- 0.6	60	30	3,118	6.6	29	29	3,177	10.3	56
650	28	3,707	0.2	40	30	3,790	8.3	31	30	3,804	4.2	55	30	3,799	6.7	42	30	3,650	- 4.1	55	30	3,726	2.3	29	29	3,796	6.9	55
600	28	4,343	- 3.0	32	30	4,445	2.8	35	30	4,447	0.6	46	30	4,445	2.0	39	30	4,271	- 8.0	53	30	4,363	- 2.2	30	29	4,445	3.3	54
550	28	5,029	- 7.0		29	5,143	- 2.7	37	28	5,146	- 3.1		28	5,146	- 2.3		30	4,948	-12.1	44	30	5,052	- 6.5	27	29	5,152	- 0.8	51
500	28	5,764	-11.8	29	30	5,891	- 7.8	30	28	5,892	- 7.1	32	28	5,894	- 6.9		29	5,664	-16.8	38	30	5,787	-11.1		29	5,902	- 5.0	44
450	28	6,568	-17.5		30	6,712	-13.2		28	6,713	-12.3	38	28	6,718	-12.3		29	6,454	-22.6	34	29	6,594	-16.5		29	6,731	-10.0	39
400	28	7,434	-23.5		30	7,590	-19.5		27	7,597	-18.3	42	28	7,599	-18.8		29	7,300	-28.9	34	29	7,464	-23.1		29	7,622	-16.0	36
350	27	8,399	-30.9		30	8,568	-26.8		27	8,580	-25.2	42	28	8,580	-25.7		29	8,240	-36.3		29	8,427	-30.7		29	8,614	-23.1	
300	27	9,474	-38.7		30	9,661	-35.1		27	9,682	-33.2	43	26	9,678	-34.0		29	9,292	-44.2		29	9,503	-38.7		29	9,724	-31.3	
250	26	10,695	-46.8		30	10,909	-43.7		27	10,939	-42.9		24	10,927	-42.7		28	10,499	-51.0		28	10,735	-47.3		28	10,989	-41.1	
200	25	12,151	-54.7		30	12,378	-53.1		27	12,405	-54.6		24	12,399	-53.2		28	11,938	-53.7		28	12,187	-54.2		28	12,468	-52.6	
175	24	13,003	-58.1		30	13,228	-58.0		27	13,248	-60.3		24	13,247	-58.8		27	12,790	-54.0		28	13,038	-56.6		28	13,317	-58.8	
150	24	13,967	-60.3		30	14,187	-63.0		24	14,188	-65.6		24	14,201	-64.7		26	13,777	-54.6		27	14,010	-58.3		28	14,268	-65.7	
125	23	15,104	-62.6		29	15,293	-68.1		23	15,286	-68.6		21	15,294	-70.9		24	14,934	-55.6		24	15,141	-60.5		26	15,356	-71.9	
100	22	16,476	-61.7		27	16,619	-70.2		22	16,624	-69.2		20	16,608	-73.2		22	16,361	-56.4		22	16,526	-60.3		22	16,655	-74.7	
80	19	17,864	-59.9		23	17,957	-66.5		19	17,962	-66.0		15	17,927	-67.1		19	17,765	-56.5		19	17,918	-59.6		19	17,965	-68.4	
60	13	19,682	-57.0		18	19,730	-59.9		14	19,723	-61.1		14	19,692	-60.5		9	19,592	-57.3		13	19,724	-58.1		15	19,719	-61.3	
50					18	20,878	-56.3		13	20,867	-58.3		13	20,835	-58.0						5	20,888	-56.5		14	20,865	-56.9	
40					15	22,292	-53.8		11	22,284	-55.5		10	22,244	-55.1										13	22,282	-53.4	
30					13	24,149	-51.3		9	24,115	-53.6		10	24,094	-51.7										9	24,150	-49.9	
20					6	26,784	-49.8		6	26,741	-50.6		7	26,746	-48.4													

Standard pressure surface (mb.)	BUFFALO, N. Y. (991 MB.)				BURRWOOD, LA. (1015 MB.)				CAMAGUEY, CUBA (1000 MB.)				CARIBOU, MAINE (992 MB.)				CHARLESTON, S. C. (1016 MB.)				CIUDAD VICTORIA, MEX. (973 MB.)				COLUMBIA, MO. (988 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	221	14.6	78	29	3	26.5	86	27	122	23.9	94	30	191	11.4	86	29	13	21.6	94	18	335	26.5	72	30	239	17.1	80
1,000	30	143			29	132	25.9	84	26	126	23.9	94	30	123			29	152	23.8	82	18	94			30	136		
950	30	583	15.3	68	29	591	23.4	79	27	586	24.1	79	30	559	12.2	68	29	605	21.4	76	18	553	25.0	73	30	581	17.6	70
900	30	1,037	12.9	67	29	1,056	20.9	75	27	1,050	21.7	74	30	1,007	10.0	69	29	1,069	18.9	73	18	1,022	21.7	76	30	1,038	15.3	68
850	30	1,516	10.2	64	29	1,549	18.2	70	27	1,545	18.9	71	30	1,480	7.7	64	29	1,559	16.4	66	17	1,516	18.4	78	29	1,522	13.4	60
800	30	2,018	7.5	59	29	2,067	15.4	65	27	2,064	15.7	71	30	1,978	5.2	57	29	2,073	13.7	64	17	2,034	15.5	69	30	2,032	12.2	46
750	30	2,554	5.2	54	29	2,615	12.4	62	27	2,611	12.7	67	30	2,512	3.1	49	29	2,622	10.8	64	17	2,588	12.5	72	30	2,577	9.6	47
700	30	3,110	3.2	41	29	3,189	9.1	60	27	3,188	9.3	65	30	3,060	0.7	47	29	3,189	7.8	57	17	3,157	9.5	69	30	3,140	6.5	45
650	29	3,711	0.1	38	29	3,805	5.6	59	25	3,805	6.0	61	30	3,657	- 2.4	47	29	3,802	4.4	51	17	3,781	6.9		30	3,747	2.9	40
600	29	4,346	- 3.3	35	29	4,450	1.7	56	25	4,453	2.2	54	30	4,283	- 5.8	43	29	4,445	1.0	49	17	4,425	3.3		30	4,387	- 1.1	38
550	29	5,029	- 7.2	34	29	5,152	- 2.3	49	24	5,156	- 2.0	49	29	4,964	- 9.9	39	29	5,143	- 2.6	47	17	5,128	- 0.8		30	5,077	- 5.7	41
500	29	5,766	-11.6	32	29	5,898	- 6.6	45	24	5,902	- 6.4	43	29	5,690	-14.5	34	29	5,890	- 7.2	46	17	5,881	- 5.0		29	5,814	-10.3	34
450	28	6,567	-16.7		29	6,724	-11.6	45	24	6,721	-11.5	42	29	6,487	-19.6		29	6,714	-12.1	46	17	6,712	- 9.2		29	6,623	-15.6	
400	28	7,437	-23.2		29	7,608	-17.3	47	24	7,612	-17.3	39	29	7,346	-26.0		29	7,596	-18.0	43	17	7,608	-14.8		29	7,497	-22.0	
350	27	8,403	-30.2		29	8,595	-24.2	40	24	8,600	-24.1	40	29	8,298	-33.4		29	8,579	-25.3	42	17	8,605	-21.5		29	8,464	-29.4	
300	27	9,481	-38.6		29	9,700	-32.3	43	24	9,705	-32.5		29	9,363	-41.2		29	9,678	-33.9	43	16	9,725	-29.7		29	9,545	-37.9	
250	25	10,708	-47.7		29	10,961	-42.0		24	10,965	-42.2		29	10,581	-48.6		29	10,929	-44.1		15	11,003	-39.5		29	10,776	-47.3	
200	25	12,154	-54.9		28	12,435	-53.8		24	12,437	-54.1		28	12,035	-53.7		29	12,385	-56.2		13	12,491	-51.8		29	12,223	-55.4	
175	24	13,009	-56.5		28	13,280	-60.2		24	13,282	-60.2		28	12,889	-55.3		29	13,222	-62.0		13	13,343	-58.6		29	13,068	-58.5	
150	24	13,981	-58.7		27	14,228	-65.9		24	14,229	-66.6		28	13,869	-56.6		27	14,168	-66.2		12	14,296	-65.7		29	14,028	-61.7	
125	23	15,120	-59.7		22	15,318	-70.7		23	15,315	-72.0		26	15,026	-57.7		21	15,260	-69.6		12	15,384	-72.9		28	15,150	-64.0	
100	19	16,537	-59.5		16	16,628	-73.1		19	16,623	-73.5		24	16,436	-57.4		16	16,579	-70.1		7	16,684	-77.0		26	16,511	-63.8	
80	13	17,914	-58.1		11	17,965	-66.9		16	17,942	-68.7		17	17,847	-55.8		13	17,903	-64.9						24	17,887	-61.3	
60					9	19,721	-61.1		12	19,688	-63.5						10	19,653	-60.1						17	19,698	-57.2	
50					9	20,859	-58.5		6	20,816	-60.3														15	20,845	-55.6	
40					5	22,290	-54.6																		9	22,276	-53.8	

Standard pressure surface (mb.)	DODGE CITY, KANS. (925 MB.)				EL PASO, TEX. (880 MB.)				ELY, NEV. (809 MB.)				GLASGOW, MONT. (940 MB.)				GRAND JUNCTION, COLO. (851 MB.)				GREAT FALLS, MONT. (888 MB.)				GREENSBORO, N. C. (987 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	792	17.4	68	29	1,195	26.5	32	30	1,908	16.3	27	30	648	12.2	62	30	1,474	19.4	28	30	1,128	12.0	56	30	273	19.1	84
1,000	30	113			29	46			30	58			30	120			30	55			30	116			30	161		
950	30	560			29	517			30	518			30	559			30	517			30	560			30	608	21.0	63
900	30	1,025	18.5	58	29	1,002			30	993			30	1,012	12.1	52	30	993			30	1,016			30	1,072	18.2	65
850	30	1,515	17.3	55	29	1,504	26.8	26	30	1,486			30	1,488	8.5	55	23	1,486	20.4	28	30	1,495	11.1	50	30	1,560	15.2	66
800	30	2,031	15.6	49	29	2,034	22.5	30	30	2,008	19.7	20	30	1,986	5.1	57	30	2,012	20.2	20	30	1,998	8.1	53	30	2,072	12.4	62
750	30	2,580	12.9	41	29	2,596	17.7	33	30	2,564	17.0	18	30	2,518	2.2	54	30	2,568	15.6	23	30	2,532	4.5	56	30	2,614	9.8	52
700	30	3,152	9.2	36	29	3,175	12.9	36	30	3,143	12.1	21	30	3,065	- 1.0	54	30	3,142	10.5	27	30	3,086	0.5	56	30	3,182	6.8	48
650	30	3,765	5.0	31	29	3,796	7.8	42	30	3,759	6.8	26	30	3,660	- 4.8	50	30	3,755	5.3	34	30	3,683	- 3.2	52	30	3,793	4.1	38
600	30	4,409	0.3	28	29	4,446	2.7	42	30	4,408	1.3	32	29	4,284	- 8.3	46	30	4,400	- 0.1	37	30	4,306	- 6.9	47	30	4,435	0.8	34
550	30	5,101	- 4.7	27	27	5,146	- 2.0	41	30	5,102	- 4.4	36	29	4,961	-12.4	44	30	5,091	- 4.6	33	30	4,986	-11.2	45	30	5,131	- 2.9	
500	30	5,844	- 9.7	24	27	5,896	- 6.7		30	5,846	- 9.5	35	29	5,676	-17.1	43	30	5,833	- 9.7		30	5,704	-16.2	43	30	5,877	- 7.8	
450	30	6,656	-15.1		26	6,711	-12.2		30	6,659	-14.2		29	6,463	-22.3	41	30	6,643	-15.5		30	6,494	-21.8	41	30	6,698	-12.7	
400	30	7,530	-21.7		26	7,600	-18.2		30	7,536	-20.6		29	7,314	-27.9	40	30	7,515	-22.3		30	7,345	-28.3	42	30	7,579	-18.7	
350	30	8,498	-29.3		24	8,582	-25.4		30	8,508	-28.5		29	8,259	-35.1		30	8,481	-29.9		29	8,288	-35.4		30	8,559	-25.9	
300	29	9,582	-37.0		24	9,683	-33.2		30	9,593	-37.1		29	9,316	-42.9		30	9,560	-38.3		30	9,344	-43.2		30	9,657	-34.2	35
250	29	10,820	-45.5		24	10,940	-42.3		30	10,829	-46.0		29	10,522	-50.7		30	10,790	-46.8		30	10,549	-50.3		30	10,907	-43.7	
200	29	12,277	-54.4		21	12,409	-53.0		29	12,287	-54.0		26	11,965	-51.8		29	12,241	-54.7		30	11,993	-53.3		30	12,370	-54.5	
175	29	13,123	-58.4		20	13,255	-58.6		29	13,137	-57.3		25	12,838	-51.6		29	13,088	-58.1		30	12,851	-53.9		30	13,215	-59.3	
150	29	14,084	-62.0		20	14,210	-64.9		27	14,105	-61.0		25	13,835	-52.7		29	14,051	-61.1		30	13,837	-55.1		30	14,170	-63.2	
125	29	15,200	-65.5		20	15,304	-70.6		27	15,227	-64.5		25	15,007	-54.2		26	15,172	-64.0		29	14,996	-56.8		29	15,281	-66.1	
100	29	16,550	-66.5		18	16,617	-71.9		27	16,587	-64.5		25	16,433	-54.9		24	16,536	-64.7		26	16,420	-57.0		28	16,631	-66.3	
80	28	17,906	-63.7		15	17,935	-67.8		25	17,957	-63.6		24	17,857	-55.0		22	17,900	-63.1		23	17,824	-57.2		25	17,989	-62.6	
60	26	19,694	-58.8		13	19,708	-60.2		24	19,733	-59.9		22	19,681	-54.2		19	19,696	-58.1		18	19,645	-56.8		21	19,778	-58.7	
50	21	20,836	-56.2		13	20,852	-57.2		24	20,877	-57.5		20	20,844	-54.8		12	20,832	-55.5		15	20,799	-56.7		8	20,939	-57.1	
40	16	22,252	-53.7		11	22,281	-54.0		23	22,287	-55.0		20	22,271	-54.5													
30	11	24,103	-52.1		7	24,122	-52.4		22	24,137	-51.5		19	24,127	-52.8													
20	9	26,727	-49.0						13	26,792	-50.2		15	26,749	-49.4													
15									6	28,708	-48.2		7	28,638	-47.9													

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

SEPTEMBER 1951

Standard pressure surface (mb)	HATTERAS, N. C. (1018 MB.)				HAVANA, CUBA (1009 MB.)				HILO, T. H. (1012 MB.)				INTERNAT. FALLS, MINN. (970 MB.)				JOLIET, ILL. (995 MB.)				LAKE CHARLES, LA. (1015 MB.)				LANDER, WYO. (830 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	3	23.4	84	30	49	26.3	86	30	9	26.5	70	30	361	9.4	86	30	179	14.0	83	30	5	23.4	88	30	1,696	13.0	49
1,000	30	155	22.8	80	30	126	26.5	82	30	114	25.5	71	30	100			30	134			30	135	24.4	79	30	92		
950	30	603	19.9	77	30	587	24.4	78	30	573	21.9	76	29	530	10.2	78	30	575	15.2	68	30	591	23.3	72	30	543		
900	30	1,066	17.3	71	30	1,053	21.9	74	30	1,032	18.6	78	30	978	8.0	76	30	1,027	12.5	66	30	1,057	20.6	71	30	1,009		
850	30	1,553	15.1	62	30	1,548	18.9	70	30	1,522	16.1	75	30	1,448	5.1	75	30	1,506	10.5	58	30	1,549	17.7	68	30	1,494		
800	30	2,065	12.5	57	30	2,067	15.9	68	30	2,036	14.2	67	30	1,941	2.6	69	30	2,009	8.2	54	30	2,066	14.8	65	30	2,007	13.4	41
750	30	2,608	9.9	55	30	2,619	12.9	64	29	2,592	12.9	41	30	2,463	0.2	65	30	2,546	6.0	48	30	2,617	12.1	60	30	2,553	9.4	45
700	30	3,176	7.0	53	30	3,191	10.2	56	30	3,157	10.5	31	30	3,011	- 2.1	60	30	3,102	3.3	46	29	3,185	9.0	55	30	3,115	5.8	46
650	30	3,788	3.6	52	30	3,811	6.9	53	30	3,780	7.7	29	30	3,599	- 5.0	59	30	3,704	0.1	42	29	3,802	5.4	56	30	3,722	1.3	49
600	30	4,428	0.3	47	30	4,458	3.0	53	30	4,425	4.3	27	30	4,222	- 8.6	58	30	4,337	- 3.4	42	29	4,445	1.4	55	30	4,356	- 3.3	50
550	29	5,124	- 3.4	45	30	5,168	- 0.7	47	29	5,128	0.1		30	4,897	-12.4	54	30	5,023	- 7.5	42	29	5,148	- 2.7	51	30	5,039	- 8.2	50
500	30	5,870	- 7.7	41	30	5,915	- 5.1	40	29	5,884	- 4.8	25	30	5,613	-17.0	51	30	5,755	-12.2	38	28	5,888	- 7.3	45	30	5,771	-13.2	47
450	30	6,695	-12.6	40	30	6,751	-10.2	44	29	6,711	-10.3		30	6,398	-22.5	49	29	6,559	-17.5	33	27	6,712	-12.4	41	30	6,571	-18.6	37
400	29	7,571	-18.5	41	30	7,635	-16.0	41	29	7,601	-16.9		30	7,251	-28.9	46	30	7,425	-23.9	32	27	7,591	-18.2	41	30	7,432	-25.1	35
350	29	8,553	-25.7		29	8,627	-22.6	37	29	8,589	-24.3		30	8,192	-36.4		30	8,385	-31.3		27	8,574	-25.0	48	30	8,388	-32.3	
300	29	9,651	-33.8	41	29	9,739	-31.1	39	29	9,693	-32.9		30	9,243	-44.6		30	9,459	-39.0		27	9,676	-33.0		30	9,457	-40.2	
250	29	10,904	-43.2		29	11,006	-41.1		28	10,948	-42.9		30	10,443	-51.2		30	10,685	-48.0		27	10,933	-42.5		30	10,678	-48.4	
200	29	12,370	-54.4		29	12,484	-53.6		28	12,415	-54.3		29	11,888	-52.4		30	12,129	-55.2		27	12,401	-54.0		29	12,121	-54.5	
175	29	13,214	-59.9		29	13,328	-60.4		27	13,258	-60.2		27	12,746	-52.5		29	12,971	-57.8		27	13,245	-59.7		29	12,971	-56.1	
150	29	14,165	-64.6		29	14,272	-67.5		25	14,204	-66.1		27	13,739	-53.3		29	13,938	-59.4		27	14,195	-65.3		28	13,947	-57.8	
125	25	15,268	-67.2		29	15,353	-73.1		22	15,293	-71.2		25	14,906	-54.5		27	15,074	-61.1		27	15,287	-71.2		28	15,091	-59.5	
100	21	16,613	-66.4		29	16,654	-73.6		18	16,603	-73.0		22	16,325	-54.5		24	16,471	-61.2		19	16,599	-72.8		24	16,492	-59.7	
80	16	17,957	-63.3		26	17,969	-68.9		17	17,917	-69.5		19	17,762	-54.2		21	17,862	-59.5		17	17,904	-68.8		22	17,883	-59.8	
60	10	19,739	-59.4		25	19,713	-62.7		16	19,657	-64.2		10	19,593	-53.4		18	19,675	-56.3		12	19,647	-62.6		19	19,675	-58.5	
50					20	20,845	-59.4		14	20,788	-60.2						16	20,841	-55.1		12	20,779	-59.6		14	20,820	-57.2	
40					7	22,255	-55.8		12	22,209	-56.0						8	22,259	-53.5		12	22,185	-56.3		11	22,225	-55.4	
30									10	24,044	-52.7										11	24,018	-53.5		8	24,023	-52.5	
20																					6	26,668	-50.1		5	26,639	-49.3	

	LAS VEGAS, NEV. (933 MB.)				LITTLE ROCK, ARK. (1007 MB.)				MAZATLAN, MEXICO (1005 MB.)				MEDFORD, ORE. (966 MB.)				MERIDA, MEXICO (1010 MB.)				MIAMI, FLA. (1016 MB.)				NANTUCKET, MASS. (1016 MB.)			
SURFACE	30	660	29.1	15	30	79	20.9	83	28	14	29.2	78	30	401	23.1	36	12	27	26.1		30	4	27.1	78	30	14	17.3	87
1,000	30	36			30	139	21.9	76	28	63	28.8	78	30	94			12	112	26.0		30	141	26.8	76	30	150	18.4	79
950	30	504			30	590	21.5	68	28	525	25.8	76	29	548	24.2	30	12	572	24.7		30	595	23.7	77	29	592	16.4	69
900	30	984	30.7		30	1,054	19.4	67	28	995	23.6	70	30	1,015	21.8	32	12	1,040	22.1		30	1,065	20.9	73	30	1,048	14.1	64
850	30	1,491	26.7		30	1,545	17.3	60	28	1,494	20.9	66	30	1,507	18.0	38	12	1,536	19.4		30	1,559	17.9	70	29	1,529	11.5	56
800	30	2,021	22.1		30	2,061	14.9	54	27	2,019	18.1	62	30	2,022	14.3	42	12	2,056	16.2		30	2,076	14.9	69	30	2,034	9.3	53
750	30	2,583	17.2		30	2,609	12.0	46	25	2,577	15.0	60	30	2,569	10.7	41	12	2,604	13.1		30	2,623	12.0	66	30	2,574	6.8	47
700	30	3,158	12.3		30	3,179	8.4	45	27	3,151	11.5	59	30	3,135	7.1	38	12	3,181	10.0		30	3,196	9.2	58	30	3,132	4.3	42
650	30	3,778	7.6	19	30	3,793	4.3	45	26	3,773	7.6	62	30	3,743	3.5	29	12	3,801	6.9		30	3,812	5.9	52	30	3,739	1.3	38
600	30	4,427	2.9		29	4,433	0.2	44	26	4,425	3.4	60	30	4,384	- 0.5		12	4,450	3.0		30	4,459	2.2	52	29	4,371	- 2.4	39
550	30	5,126	- 1.7		29	5,128	- 3.6	39	26	5,124	- 0.7	51	30	5,073	- 4.7		12	5,158	- 0.8		30	5,160	- 1.7	48	28	5,060	- 6.5	33
500	30	5,877	- 6.4		29	5,872	- 8.1	33	26	5,881	- 5.0		30	5,817	- 9.7		12	5,906	- 5.2		30	5,910	- 6.0	47	29	5,795	-11.0	30
450	30	6,699	-12.4		28	6,686	-13.5		26	6,707	- 9.6		30	6,626	-15.2		11	6,736	-10.3		30	6,732	-10.9	43	29	6,603	-16.3	
400	30	7,581	-19.2		28	7,567	-19.8		26	7,604	-14.9		30	7,501	-21.6		11	7,624	-15.4		30	7,624	-16.7	38	29	7,474	-22.2	
350	30	8,560	-26.8		27	8,543	-26.8		24	8,599	-22.2		30	8,470	-29.4		11	8,618	-22.5		30	8,612	-24.0		28	8,443	-29.2	
300	30	9,652	-35.5		26	9,638	-34.7		23	9,715	-30.2		30	9,550	-38.1		11	9,730	-30.6		30	9,717	-32.5		28	9,526	-37.2	
250	30	10,897	-44.4		26	10,887	-43.5		22	10,985	-40.0		29	10,776	-47.6		11	10,999	-40.7		30	10,977	-42.5		28	10,760	-46.6	
200	30	12,361	-53.7		25	12,360	-53.2		19	22,470	-52.4		28	12,215	-55.7		10	12,478	-53.6		30	12,444	-54.9		28	12,210	-55.3	
175	30	13,209	-58.4		24	13,207	-58.0		17	13,327	-59.4		28	13,059	-57.9		10	13,322	-60.7		30	13,283	-61.7		28	13,053	-59.2	
150	30	14,166	-63.4		23	14,172	-62.5		15	14,276	-67.0		28	14,026	-59.9		9	14,258	-68.0		30	14,222	-68.1		28	14,011	-61.9	
125	30	15,273	-67.4		22	15,283	-66.9		7	15,353	-74.1		27	15,154	-62.5		6	15,339	-74.2		26	15,308	-72.6		28	15,134	-63.2	
100	30	16,607	-69.3		18	16,632	-67.8		5	16,635	-78.2		22	16,537	-63.6		5	16,630	-78.1		21	16,622	-72.8		28	16,505	-62.3	
80	29	17,943	-66.8		17	17,985	-64.4						21	17,907	-62.3						16	17,933	-67.4		22	17,894	-59.5	
60	24	19,724	-60.2		16	19,761	-58.6						14	19,680	-59.6						13	19,673	-62.6		14	19,696	-56.6	
50	18	20,868	-57.2		14	20,915	-56.4						10	20,818	-57.7						13	20,809	-58.3		10	20,857	-55.4	
40	9	22,251	-54.8		14	22,340	-53.3						6	22,230	-55.5						11	22,236	-53.6					
30					13	24,198	-50.9						6	24,073	-53.0						10	24,109	-49.5					
20					6	26,855	-49.2																					

	NASHVILLE, TENN. (997 MB.)				NORTH PLATTE, NEBR. (918 MB.)				OAKLAND, CALIF. (1012 MB.)				OKLAHOMA CITY, OKLA. (969 MB.)				OMAHA, NEBR. (980 MB.)				PHOENIX, ARIZ. (969 MB.)				PITTSBURGH, PA. (974 MB.)			
SURFACE	30	177	20.9	74	30	849	13.7	78	30	6	16.4	75	30	391	22.1	67	30	308	15.8	78	30	338	28.7	47	29	382	16.7	67
1,000	30	145			30	114			30	108	15.7	76	30	117			30	133			30	56			29	151		
950	30	593	20.8	62	30	558			30	555	18.1	63	29	570	23.0	59	30	576	16.2	65	30	521	32.6	23	28	596	17.2	60
900	30	1,057	18.0	62	30	1,015	15.4	63	30	1,011	21.4	32	30	1,037	20.8	56	30	1,029	13.6	65	30	1,001	29.5	21	29	1,051	14.7	61
850	30	1,545	15.5	60	30	1,499	13.9	55	30	1,504	19.6	25	30	1,530	19.0	52	30	1,509	11.4	63	30	1,506	25.7	20	29	1,532	11.8	61
800	30	2,057	13.1	54	30	2,008	11.1	56	30	2,023	16.6	26	30	2,048	16.2	52	30	2,014	9.3	57	30	2,034	21.4	22	29	2,037	9.2	56
750	30	2,602	10.5	48	30	2,551	8.8	52	30	2,574	13.3	27	30	2,602	12.7	55	30	2,556	7.3	49	30	2,593	16.8	24	29	2,577	7.2	39
700	30	3,168	7.3	43	30	3,113	5.7	43	30	3,145	9.9	26	30	3,170	9.0	52	30	3,114	4.7	42	30	3,169	12.2	28	29	3,135	4.7	33
650	30	3,779	3.7	40	30	3,720	2.0	39	30	3,760	6.3		30	3,785	5.2	43	30	3,720	0.9	42	30	3,789	7.7	28	28	3,738	1.5	32
600	30	4,419	- 0.2	35	30	4,356	- 2.6	43	30	4,407	2.1		30	4,428	0.8	38	30	4,354	- 2.8	38	30	4,438	3.2	26	28	4,374	- 2.0	32
550	30	5,115	- 4.4		30	5,045	- 7.3	41	30	5,104	- 2.5		30	5,127	- 3.3	31	30	5,043	- 7.2	34	29	5,141	- 1.5		28	5,062	- 6.1	
500	29	5,858	- 8.4	30	29	5,778	-12.4	35	30	5,853	- 7.8		30	5,869	- 7.9	28	30	5,775	-12.0		30	5,888	- 6.3		28	5,800	-10.7	29
450	28	6,680	-13.6		29	6,582	-18.0	33	30	6,670	-13.3		30	6,688	-13.3		30	6,582	-17.6		30	6,711	-11.9		28	6,605	-16.0	
400	29	7,553	-19.6		29	7,444	-24.7		30	7,551	-20.1		30	7,565	-19.8		30	7,445	-24.1		30	7,594	-18.5		28	7,479	-22.2	
350	28	8,530	-26.8		29	8,401	-31.9		30	8,526	-27.8		30	8,541	-27.2		30	8,405	-31.5		29	8,575	-25.8		28	8,445	-29.8	
300	28	9,623	-35.1		29	9,472	-39.9		30	9,613	-36.5		30	9,631	-35.7		30	9,478	-39.6		29	9,673	-33.9		27	9,528	-38.0	
250	27	10,865	-44.5		29	10,694	-48.1		30	10,854	-45.2		30	10,874	-44.8		30	10,704	-47.7		29	10,927	-42.8		26	10,760	-46.5	
200	27	12,326	-54.3		29	12,142	-53.9		29	12,314	-53.4		28	12,339	-53.6		30	12,152	-54.7		28	12,399	-52.6		24	12,210	-54.8	
175	27	13,171	-58.8		28	12,999	-56.1		29	13,165	-57.2		28	13,188	-58.0		28	13,015	-57.1		26	13,254	-57.9		22	13,059	-57.9	
150	27	14,127	-63.4		28	13,971	-58.9		28	14,130	-61.3		28	14,147	-62.8		25	13,990	-59.3		26	14,210	-63.7		23	14,024	-60.4	
125	25	15,240	-67.2		28	15,108	-61.0		27	15,249	-65.0		26	15,254	-66.9		22	15,126	-61.6		26	15,314	-68.9		21	15,157	-62.1	
100	24	16,577	-67.8		26	16,498	-62.4		26	16,601	-66.5		23	16,590	-67.9		18	16,501	-62.6		24	16,640	-71.4		18	16,540	-62.0	
80	22	17,934	-64.4		24	17,884	-61.1		24	17,958	-64.4		18	17,940	-64.0		13	17,881	-60.9		22	17,969	-68.3		16	17,932	-59.5	
60	20	19,714	-59.4		19	19,696	-57.5		21	19,731	-60.1		16	19,714	-59.1		12	19,679	-58.2		17	19,721	-60.9		6	19,732	-56.8	
50	19	20,858	-57.4		18	20,848	-55.9		18	20,868	-57.6		15	20,853	-57.3		11	20,824	-55.8		16	20,867	-58.0					
40	17	22,265	-55.6		15	22,284	-53.7		18	22,284	-54.9		15	22,275	-54.0		11	22,247	-54.4		14	22,296	-54.6					
30	13	24,122	-53.2		15	24,137	-52.0		13	24,131	-51.6		8	24,124	-52.1		11	24,102	-52.3		12	24,146	-51.8					
20					13	26,771	-49.0										5	26,732	-49.3		9	26,800	-48.3					
15					9	28,676	-47.8																					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

SEPTEMBER 1951

Standard pressure surface (mb.)	PORTLAND, MAINE (1014 MB.)				RAPID CITY, S. DAK. (906 MB.)				ST. CLOUD, MINN. (976 MB.)				SAN ANTONIO, TEX. (986 MB.)				SAN JUAN, P. R. (1013 MB.)				SANTA MARIA, CALIF. (1004 MB.)				S. STE. MARIE, MICH. (987 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	20	13.3	94	30	966	11.5	69	30	317	11.4	85	30	240	26.2	67	30	19	26.0	86	30	71	14.7	87	30	221	10.1	87
1,000	30	140	15.7	82	30	122			30	113			30	116			30	130	26.0	82	30	108	14.6	86	30	114		
950	30	578	15.1	72	30	561			30	551	12.5	73	30	574	25.3	67	29	593	23.8	78	30	558	18.2	67	30	546	10.7	73
900	29	1,035	12.8	70	30	1,017			30	998	9.9	70	30	1,045	22.2	70	30	1,055	21.0	77	30	1,011	22.4	34	30	993	9.0	66
850	29	1,514	10.6	65	30	1,498	11.4	57	30	1,471	7.1	71	30	1,540	19.2	70	30	1,549	18.3	74	29	1,506	21.1	28	30	1,464	6.5	62
800	29	2,017	8.2	62	30	2,002	8.4	59	30	1,967	4.7	68	30	2,059	16.3	64	30	2,067	15.5	72	30	2,027	17.6	28	30	1,961	4.7	55
750	29	2,559	5.7	58	30	2,539	5.5	57	30	2,500	2.2	64	30	2,607	13.8	54	30	2,615	12.8	66	30	2,582	14.2	24	30	2,491	2.0	59
700	29	3,110	2.8	51	30	3,095	3.0	50	30	3,047	- 0.3	57	30	3,185	10.5	50	30	3,191	9.9	58	30	3,153	10.8		30	3,039	- 0.8	54
650	29	3,711	- 0.2	45	30	3,694	- 1.0	49	30	3,642	- 3.1	54	30	3,799	6.7	47	30	3,806	6.5	57	30	3,775	7.0		30	3,633	- 4.1	53
600	29	4,342	- 3.6	41	30	4,325	- 5.5	47	30	4,267	- 6.8	48	30	4,451	2.9	46	30	4,457	3.0	55	30	4,418	2.6		30	4,255	- 7.4	48
550	29	5,030	- 7.6		30	5,006	- 9.8	45	30	4,948	-11.2	44	30	5,152	- 1.4	39	30	5,168	- 0.8	54	30	5,121	- 1.6		30	4,931	-11.2	41
500	28	5,758	-12.2		30	5,731	-14.4	40	30	5,666	-15.9	41	30	5,903	- 5.4		29	5,912	- 5.3	51	30	5,868	- 6.9		30	5,654	-15.6	41
450	28	6,561	-17.9		30	6,526	-19.7	41	30	6,460	-21.1	36	30	6,726	-10.8		29	6,745	-10.3	47	30	6,689	-12.8		30	6,446	-20.8	40
400	28	7,425	-24.2		30	7,386	-26.0	39	30	7,312	-27.1	35	30	7,618	-16.9		29	7,631	-16.0	43	30	7,570	-19.6		30	7,303	-27.1	40
350	28	8,384	-31.3		29	8,338	-33.4		30	8,260	-34.1		30	8,606	-23.8		29	8,623	-23.1	41	30	8,547	-27.2		30	8,250	-34.5	37
300	27	9,458	-38.6		30	9,402	-41.6		30	9,323	-41.5		30	9,714	-31.7		28	9,733	-31.4	37	30	9,639	-35.4		30	9,309	-42.7	
250	26	10,689	-47.1		30	10,614	-49.9		30	10,538	-49.0		30	10,978	-41.2		26	10,996	-41.7		30	10,885	-44.4		30	10,520	-49.5	
200	24	12,148	-55.0		30	12,054	-54.1		29	11,986	-52.5		29	12,457	-52.5		26	12,468	-54.2		30	12,350	-53.5		29	11,952	-54.2	
175	23	13,005	-57.7		29	12,905	-54.6		28	12,855	-53.7		29	13,308	-58.3		26	13,310	-61.0		30	13,199	-58.4		29	12,807	-54.5	
150	22	13,963	-60.4		28	13,893	-56.3		26	13,844	-54.4		29	14,262	-64.7		25	14,253	-67.9		30	14,156	-63.7		29	13,792	-55.2	
125	19	15,109	-61.2		24	15,054	-57.3		26	15,007	-56.2		29	15,358	-70.6		24	15,335	-72.6		29	15,260	-68.1		27	14,949	-55.7	
100	14	16,496	-61.5		23	16,458	-58.8		24	16,419	-55.9		27	16,669	-73.1		24	16,639	-73.5		29	16,592	-69.3		26	16,369	-56.1	
80	13	17,887	-58.9		20	17,866	-58.1		22	17,839	-55.7		23	17,990	-67.7		21	17,948	-70.7		28	17,934	-66.4		23	17,791	-55.6	
60	7	19,727	-57.2		8	19,678	-57.8		14	19,681	-54.5		21	19,755	-60.9		16	19,677	-64.1		24	19,696	-60.7		13	19,641	-55.0	
50					6	20,842	-56.8		10	20,843	-54.0		20	20,894	-58.3		12	20,811	-60.8		22	20,838	-57.2		10	20,793	-54.2	
40					5	22,246	-55.5						17	22,308	-54.6		5	22,189	-58.5		20	22,259	-54.3					
30													15	24,153	-51.3						17	24,115	-51.4					
20													9	26,806	-47.9						5	26,791	-49.3					

Standard pressure surface (mb.)	SPOKANE, WASH. (931 MB.)				SWAN ISLAND, W. I. (1011 MB.)				TACUBAYA, MEXICO (773 MB.)				TAMPA, FLA. (1015 MB.)				TATOOSH ISLAND, WASH. (1012 MB.)				TOLEDO, OHIO (994 MB.)				WASHINGTON, D. C. (1008 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	722	16.9	44	30	10	27.4	85	11	2,306	16.9		30	9	26.1	82	30	31	11.3	90	30	191	15.6	77	30	88	18.4	82
1,000	30	105			30	108	27.6	82	11	55			30	142	26.1	78	30	127			30	139			30	159	19.9	76
950	30	552			30	572	24.6	80	11	517			30	597	24.1	74	30	570	14.6	66	30	581	16.2	59	30	603	18.8	65
900	30	1,012	17.2	39	30	1,036	21.6	79	11	995			30	1,067	21.3	73	30	1,017	13.6	58	30	1,036	13.3	61	30	1,064	15.8	64
850	30	1,496	13.6	42	30	1,531	18.8	75	11	1,491			30	1,561	18.3	72	30	1,497	11.6	51	30	1,514	10.3	59	30	1,548	13.1	62
800	30	2,003	9.6	47	30	2,050	16.0	71	11	2,021			30	2,079	15.3	72	30	2,001	9.3	48	30	2,017	8.2	51	30	2,056	10.5	58
750	30	2,541	5.8	49	30	2,601	13.1	67	11	2,575	14.9		30	2,628	12.5	61	28	2,539	6.3	49	30	2,558	6.1	41	30	2,597	7.9	48
700	30	3,096	2.4	47	30	3,174	9.8	63	11	3,149	10.7		30	3,201	9.6	61	30	3,096	3.4	46	30	3,111	3.3	35	30	3,157	5.2	41
650	30	3,693	- 1.3	45	30	3,792	6.4	59	11	3,768	6.5		29	3,818	6.4	57	28	3,698	0.3	42	29	3,717	0.5	33	30	3,765	2.3	36
600	30	4,324	- 5.2	40	30	4,440	2.7	56	11	4,417	2.7		29	4,466	2.6	55	29	4,337	- 3.0	38	29	4,346	- 3.2	32	30	4,401	- 1.4	35
550	30	5,003	- 9.4	40	30	5,141	- 1.4	55	11	5,122	- 1.5		29	5,170	- 1.1	50	28	5,021	- 7.1	35	29	5,034	- 7.0	31	30	5,092	- 5.4	
500	29	5,730	-14.2	36	30	5,893	- 5.8	52	11	5,870	- 5.5		28	5,921	- 5.6	46	29	5,756	-12.1	34	29	5,767	-11.5	30	30	5,831	- 9.9	
450	29	6,525	-19.5		30	6,719	-10.4	43	11	6,698	-10.2		28	6,749	-10.6	48	29	6,559	-17.5		29	6,575	-16.8	35	30	6,643	-15.1	
400	29	7,386	-25.7		30	7,611	-16.0	46	11	7,590	-16.0		28	7,636	-16.3	47	29	7,425	-23.9		29	7,441	-23.1		30	7,516	-21.2	
350	29	8,339	-32.7		30	8,602	-22.9	40	11	8,583	-22.7		26	8,627	-23.2	47	29	8,384	-31.6		28	8,403	-30.2		30	8,487	-28.5	
300	29	9,406	-40.8		30	9,714	-31.1	39	10	9,700	-30.6		26	9,737	-31.6	41	28	9,457	-40.1		28	9,481	-38.3		30	9,572	-36.5	
250	29	10,623	-48.8		30	10,980	-41.0		10	10,971	-40.4		26	11,000	-41.6		26	10,689	-48.8		28	10,711	-47.4		30	10,812	-45.4	
200	29	12,069	-53.5		29	12,457	-53.3		10	12,452	-53.2		25	12,474	-53.7		25	12,130	-55.6		26	12,150	-55.4		29	12,264	-55.0	
175	28	12,934	-54.6		29	13,303	-60.0		9	13,294	-60.4		25	13,319	-59.9		24	12,989	-58.0		26	12,995	-58.2		29	13,108	-59.5	
150	28	13,916	-55.6		28	14,247	-67.4						24	14,264	-66.0		24	13,957	-59.0		26	13,960	-60.4		28	14,065	-63.3	
125	28	15,075	-56.7		28	15,327	-73.9						21	15,358	-70.2		22	15,104	-60.1		24	15,094	-61.9		28	15,177	-65.8	
100	28	16,486	-57.1		21	16,620	-75.2						19	16,679	-71.4		20	16,501	-59.7		23	16,462	-61.7		27	16,530	-64.8	
80	28	17,897	-56.6		18	17,930	-70.7						16	18,015	-66.1		19	17,902	-58.6		22	17,846	-58.8		25	17,901	-62.0	
60	25	19,724	-55.5		13	19,654	-64.6						14	19,783	-60.6		12	19,712	-57.2		16	19,667	-56.4		24	19,696	-57.9	
50	24	20,882	-55.2		12	20,772	-60.7						13	20,929	-57.6						13	20,830	-55.6		22	20,848	-56.7	
40	23	22,313	-54.6		5	22,185	-57.6						12	22,354	-54.2										20	22,268	-54.7	
30	16	24,171	-53.2										10	24,206	-50.8										18	24,119	-52.1	
20	5	26,839	-50.1										8	26,859	-48.1										7	26,741	-49.9	
15													7	28,763	-45.7													

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

SEPTEMBER 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	179	2.7	30	266	1.8	29	349	2.3	29	288	3.4	30	322	2.8	29	113	4.5	29	240	3.8	29	197	2.8	29	112	1.7	29	241	2.3	30	182	2.0	30	278	1.8
500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	29	127	5.0	29	243	5.9	29	204	5.2	28	118	2.5	29	251	2.6	—	—	—	—	—	—
1,000	29	187	4.3	—	—	—	—	—	—	28	300	5.1	30	320	3.1	28	128	4.7	26	234	8.0	24	227	5.8	27	114	1.1	28	250	3.2	—	—	—	—	—	—
1,500	28	179	4.3	—	—	—	29	303	2.1	24	301	7.0	30	309	3.3	25	136	3.8	23	237	8.5	21	256	6.2	26	282	.6	27	250	4.7	30	191	1.9	—	—	—
2,000	28	184	3.8	30	261	2.6	29	290	3.6	19	296	6.7	30	297	3.6	23	149	3.7	20	231	10.0	19	259	7.7	23	298	1.5	27	264	6.6	30	199	1.6	30	267	1.9
2,500	27	191	2.4	30	260	3.2	26	282	6.6	17	305	8.0	30	289	4.2	17	147	4.5	19	240	10.7	17	261	9.2	21	276	2.3	24	278	8.3	30	229	1.6	30	251	2.6
3,000	25	225	1.3	30	270	4.9	21	276	9.4	12	295	8.8	30	286	5.5	14	138	3.7	17	248	11.1	16	263	10.5	21	285	2.5	21	285	9.5	30	253	1.6	30	240	3.2
4,000	23	288	2.0	30	275	7.2	16	276	10.3	12	301	11.4	28	284	8.6	12	122	2.0	16	258	12.7	13	265	11.8	20	272	4.5	17	286	9.9	30	275	2.2	29	262	5.3
5,000	18	330	4.5	28	278	9.1	16	284	11.9				27	290	11.2				11	260	13.3	12	267	13.3	19	272	6.4	15	286	11.2	30	274	2.8	28	266	8.1
6,000	15	320	7.0	28	284	9.4	14	285	15.0				26	294	12.6							10	269	14.5	15	274	6.7	13	281	13.8	29	299	3.2	27	271	10.7
8,000	11	311	9.3	25	287	10.8							19	295	16.1										10	289	8.4	10	283	18.2	27	282	6.0	22	281	15.0
10,000	10	287	15.0	23	288	14.8							11	297	19.8																22	290	9.8	13	278	18.1
12,000				20	292	18.0																									21	280	16.8	10	281	20.5
14,000				17	281	23.0																									12	289	17.9			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Little Rock Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	298	4.5	29	169	0.2	29	309	2.3	27	99	3.1	30	234	3.4	29	90	1.7	30	308	1.1	30	105	4.0	28	74	1.3	29	322	0.6	29	281	3.9	29	179	4.1
500	—	—	—	29	105	.4	—	—	—	27	101	4.6	30	229	4.8	29	101	1.3	30	312	1.4	30	109	5.5	28	83	1.7	29	322	1.4	29	282	3.4	29	182	4.2
1,000	—	—	—	29	176	.5	29	300	3.6	27	96	2.3	28	233	6.3	27	135	.1	30	317	1.7	30	112	4.6	26	92	1.3	29	292	1.7	25	252	1.4	29	186	4.7
1,500	30	299	4.6	27	265	1.9	27	284	5.3	23	31	.5	25	236	7.9	23	258	1.7	28	259	1.1	30	109	3.7	21	98	1.1	28	282	2.5	24	216	1.7	28	203	5.5
2,000	30	301	4.7	26	290	3.7	24	278	6.1	20	270	.4	21	253	10.5	19	249	2.6	26	222	1.8	29	105	2.8	17	72	1.1	26	276	4.0	23	203	2.7	26	221	6.3
2,500	30	275	4.7	26	299	5.5	19	276	6.5	19	294	1.2	14	268	9.8	15	267	1.6	26	225	2.6	29	98	2.6	11	120	.7	25	272	4.6	23	201	3.2	25	236	7.4
3,000	30	258	6.2	25	290	6.2	18	281	8.1	17	285	1.9	14	273	10.9	14	303	1.5	26	226	2.6	29	101	2.2				22	280	6.3	22	199	3.6	23	242	7.5
4,000	30	259	7.0	21	283	6.7	11	290	6.8	12	280	3.5	12	276	12.4				23	255	4.6	24	120	1.8				21	281	8.0	22	213	3.9	23	250	8.3
5,000	29	273	10.1	18	278	8.8							12	272	13.9				22	263	5.0	19	130	1.8				16	281	9.7	19	231	5.1	20	279	8.6
6,000	26	282	13.0	16	275	12.1													19	277	7.3	17	82	1.3				14	276	10.4	19	233	5.7	17	290	8.7
8,000	24	290	18.6																17	282	9.3	12	99	1.7				11	269	14.5	17	244	7.6	12	291	11.9
10,000	20	295	24.7																11	282	11.7										11	265	9.2			
12,000																			10	275	14.9															

Altitude (meters) m.s.l.	Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (116 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	257	1.3	30	202	0.2	30	338	3.7	29	266	2.7	30	202	1.5	28	136	3.0	28	278	3.5	26	271	2.4	29	297	2.1	30	243	1.6	28	90	
500	30	232	1.8	[illegible]	214	.4	—	—	—	29	271	3.6	30	213	2.4	28	134	3.7	24	309	4.0	26	269	4.7	29	275	1.5	—	—	—	28	210	2.1
1,000	26	242	3.[illegible]	[illegible]	232	1.0	30	339	3.9	27	274	5.2	30	232	3.9	28	129	3.7	23	297	2.7	26	269	6.0	26	212	.4	30	247	2.2	28	246	2.5
1,500	23	262	6.2	[illegible]	255	2.2	29	318	4.2	18	267	6.2	29	253	6.2	25	134	3.8	23	294	2.2	22	258	7.3	24	183	2.5	30	235	3.4	28	258	4.6
2,000	20	258	7.9	30	253	2.9	25	302	6.9	17	275	9.0	25	263	8.8	22	153	3.0	23	263	1.5	21	261	9.0	22	211	2.3	30	240	4.1	25	261	5.9
2,500	20	267	10.2	30	252	3.8	22	299	10.0	13	270	10.0	23	266	11.4	20	142	1.7	23	228	2.0	16	251	7.7	20	197	1.2	28	255	5.2	24	262	6.8
3,000	19	266	13.5	29	249	3.6	19	294	11.8	13	270	11.7	20	268	13.5	19	126	1.2	23	218	3.7	16	255	8.8	20	270	.6	25	274	6.6	23	265	8.1
4,000	14	277	17.3	29	248	4.6	14	296	13.8	11	277	13.4	18	267	13.9	16	48	.9	22	218	6.2	14	266	12.7	19	292	2.4	22	295	9.1	21	265	10.0
5,000	14	280	17.5	26	236	5.3	12	290	15.1				15	275	16.2	13	306	1.3	22	215	6.8	11	281	14.1	15	310	4.0	19	294	10.9	20	262	10.6
6,000	14	273	17.9	23	267	3.4	10	289	16.9				12	275	17.4				20	227	4.0	10	287	15.5	13	307	5.9	16	308	12.9	19	270	12.8
8,000				17	297	4.0													20	230	5.0				10	297	10.5	14	305	16.6	11	277	14.9
10,000				13	276	9.5													17	250	6.0												
12,000																			16	255	12.6												
14,000																			10	253	17.9												

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	112	1.4	30	132	4.8	30	290	1.2	30	110	3.3	30	84	2.0	30	214	2.6	30	56	0.8	30	135	1.1	30	1	1.3	30	158	0.7	30	49	1.1	30	250	1.3
500	--	---	----	--	---	----	--	---	----	29	121	6.4	30	84	3.1	30	247	6.2	30	107	3.2	29	189	2.7	--	---	----	30	166	2.5	30	132	1.3	29	271	2.0
1,000	--	---	----	30	145	6.0	30	302	4.5	29	120	6.0	30	83	3.5	30	261	8.0	29	108	1.8	29	233	4.0	--	---	----	30	202	2.1	30	174	.6	29	288	3.3
1,500	--	---	----	30	160	6.0	30	303	6.2	29	124	5.0	30	83	3.9	29	267	8.6	29	93	.6	29	259	5.0	30	358	1.2	30	264	2.3	30	260	1.3	28	292	5.1
2,000	30	266	3.5	30	174	5.2	29	302	7.0	29	120	4.2	30	86	3.3	29	267	9.7	29	349	.4	30	268	7.9	29	294	2.3	30	275	3.0	30	284	1.7	28	292	5.9
2,500	30	274	4.4	30	188	3.1	29	305	8.3	29	127	4.0	30	99	2.1	29	265	11.1	29	279	2.3	30	267	8.7	29	270	3.9	30	281	3.3	30	272	2.6	28	293	6.5
3,000	30	280	5.4	29	226	2.2	29	299	9.3	29	140	3.4	29	136	1.6	29	259	12.0	30	296	3.0	30	274	10.2	29	266	4.4	30	278	4.1	30	266	3.5	27	293	6.8
4,000	30	276	6.7	28	319	3.1	29	294	11.1	30	116	2.1	29	204	2.8	29	256	16.0	30	288	4.2	30	276	14.0	29	268	6.8	30	286	5.2	30	260	5.2	27	289	8.9
5,000	29	278	8.2	27	314	4.3	29	290	13.4	30	114	.9	29	219	4.1	28	261	17.1	29	277	5.3	29	276	15.4	29	278	8.9	30	287	7.9	30	263	6.0	28	288	10.2
6,000	28	284	8.9	27	315	4.6	28	291	13.9	30	343	.5	28	228	5.8	28	263	18.4	29	270	5.7	28	275	16.8	29	280	13.1	30	274	9.2	29	263	7.2	28	294	11.3
8,000	29	285	9.9	26	296	5.6	28	288	17.2	29	299	1.9	27	221	6.5	26	262	22.2	28	273	9.9	26	262	19.9	28	281	17.0	30	262	13.5	28	255	12.3	22	278	10.9
10,000	26	284	15.8	22	283	12.3	24	278	19.3	28	279	2.9	27	228	7.6	22	261	26.7	27	266	15.5	20	264	21.5	24	292	22.6	29	260	19.4	27	262	18.2	16	289	14.8
12,000	25	281	21.5	22	279	18.5	21	288	20.2	28	294	4.5	28	246	7.7	18	269	23.3	26	263	18.8	17	262	23.6	14	301	26.1	29	261	25.2	26	271	22.5	15	279	20.9
14,000	23	283	21.9	13	277	17.0	15	285	17.1	28	330	4.9	26	259	7.0	15	265	21.0	25	275	15.3							24	277	19.6	24	267	18.7			
16,000	18	275	16.8				13	290	13.4	23	4	2.1	19	271	3.3	13	257	15.0	15	274	6.1							22	274	12.4	18	274	13.6			
18,000	14	298	7.2				10	298	7.9	15	72	5.5	10	82	4.6				12	8	.6							17	268	4.4	13	228	3.1			
20,000	10	356	1.3							13	88	13.4																10	131	2.3						
22,000										11	88	14.8																								

	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
Surface	30	90	0.8	30	328	1.8	30	85	1.7	30	226	1.0	30	354	0.3	30	278	3.1	30	113	2.9	30	336	2.2	30	110	4.1	30	194	1.5	30	250	1.1	30	274	2.3
500	30	139	4.1	30	331	2.6	30	107	5.1	28	249	5.3	29	139	.7	30	287	3.7	27	112	3.6	--	---	----	30	128	6.8	29	104	6.5	29	266	2.9	29	327	2.6
1,000	30	167	3.5	30	326	4.0	30	102	5.1	28	257	5.7	28	194	2.2	30	279	2.7	27	154	4.9	29	334	2.4	30	135	6.7	29	100	6.8	29	276	5.9	29	344	2.3
1,500	30	215	3.5	30	312	2.5	30	99	4.2	28	253	6.4	28	223	3.7	30	246	1.7	27	187	3.9	29	332	4.4	30	139	4.5	30	94	6.7	29	279	7.4	30	59	1.3
2,000	30	240	3.9	30	259	1.7	30	96	3.6	28	252	7.7	28	251	4.0	30	219	1.8	27	211	5.3	29	301	5.9	30	144	2.4	30	93	6.4	28	286	8.5	30	106	1.0
2,500	29	253	4.0	30	236	2.6	30	100	3.7	29	255	8.3	28	272	5.0	30	207	2.7	29	239	6.3	29	298	8.1	30	104	1.3	30	90	6.4	28	281	9.1	30	154	1.4
3,000	27	275	4.6	30	243	3.4	30	103	3.2	29	253	9.3	28	276	6.3	30	207	3.4	29	256	6.4	29	290	10.6	30	65	1.7	30	92	6.1	29	282	9.2	29	195	2.0
4,000	27	291	5.3	30	260	4.9	30	95	2.4	27	256	11.1	28	274	8.3	30	214	4.3	29	278	7.0	29	281	14.1	30	32	2.0	30	90	5.3	29	279	11.6	29	216	3.7
5,000	26	300	6.5	30	264	6.5	30	89	1.8	27	264	11.4	29	280	9.1	30	218	5.7	29	286	8.3	28	281	14.5	30	349	2.6	30	90	4.6	29	277	15.1	30	219	5.1
6,000	26	301	6.9	30	273	6.9	30	101	1.4	27	260	13.7	28	281	10.2	30	224	6.7	30	286	9.6	28	283	17.5	29	337	1.9	29	97	3.1	28	273	16.9	30	221	6.1
8,000	26	280	11.9	29	286	10.3	29	92	1.0	23	257	19.3	26	271	13.6	30	245	10.6	30	278	12.6	27	277	21.3	29	278	5.0	28	108	2.6	26	264	21.3	30	229	8.0
10,000	24	265	18.3	28	278	11.1	29	2	1.6	19	262	19.0	26	256	19.8	28	247	13.6	29	278	15.3	23	276	27.6	29	263	7.9	26	92	1.2	20	265	24.4	30	244	12.6
12,000	19	262	20.8	26	265	15.2	29	343	5.3	14	279	18.0	24	256	26.8	18	260	16.6	29	274	18.2	15	279	25.7	26	266	9.5	25	317	1.4	16	262	24.0	29	242	16.1
14,000	14	275	18.8	18	276	16.9	27	9	2.9	13	268	15.4	18	271	22.3	12	262	14.6	27	270	21.7	11	294	22.3	21	274	10.0	24	326	1.9				26	251	13.3
16,000	11	292	11.4	13	284	12.9	20	29	3.6				12	276	10.7				18	268	15.7				15	267	8.3	24	85	2.5				25	252	5.8
18,000							14	91	6.8				10	273	4.3				13	259	8.1				10	69	1.4	20	96	9.0				27	8	1.0
20,000							11	83	10.0										10	225	1.1							12	81	13.1				24	58	3.7
22,000							10	89	13.6																									20	79	3.9
24,000																																		15	76	4.7

	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)			Washington, D.C. (24 m.)		
Surface	30	227	0.6	30	232	0.9	30	176	1.8	30	160	0.4
500	30	240	3.6	--	---	----	30	266	2.0	30	213	4.1
1,000	30	249	6.8	29	314	1.1	29	289	1.3	30	252	4.3
1,500	30	258	7.6	29	304	2.6	29	260	1.6	30	263	4.2
2,000	29	266	8.1	29	289	3.6	28	304	2.5	29	268	5.0
2,500	27	264	7.9	29	286	4.6	27	316	4.0	29	259	5.8
3,000	25	277	8.3	29	267	5.6	26	318	4.5	28	254	6.1
4,000	25	269	10.7	30	278	9.3	24	318	7.2	26	266	7.7
5,000	23	275	10.7	28	293	10.8	23	317	8.8	25	267	9.1
6,000	22	276	13.0	24	300	13.5	21	308	8.0	25	269	11.7
8,000	16	270	19.0	20	311	14.5	17	304	10.7	23	259	16.6
10,000	10	277	20.0	15	301	18.2	13	307	15.1	18	256	19.7
12,000				11	287	21.4	10	287	15.1	10	265	20.3

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30. —Solar radiation intensities, tabulated in langleys per minute.

TABLE MOUNTAIN, CALIF.

Date	Sun's zenith distance, A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°	Vapor pressure, E.S.T. 7:30 a. m.	Vapor pressure, E.S.T. 1:30 p. m.
Air mass	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
September										*Mb.*	*Mb.*
2	----	----	----	1.49	----	----	----	----	----		
3	----	----	----	1.49	----	----	----	----	----		
22	----	----	----	1.47	----	----	----	----	----		
23	----	----	----	1.45	----	----	----	----	----		
24	1.15	1.24	1.34	1.47	----	----	----	----	----		
25	1.16	1.24	1.34	1.47	----	----	----	----	----		
26	----	1.22	1.33	1.46	----	----	----	----	----		
29	----	----	----	1.46	----	----	----	----	----		
Averages	1.16	1.23	1.34	1.47	----	----	----	----	----		
Departures	+.03	+.01	+.02	+.04	----	----	----	----	----		

LINCOLN, NEBR.

Date	A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
September										*Mb.*	*Mb.*
6	----	----	----	1.01	1.26	----	----	----	----	13.7	14.2
10	----	0.81	0.96	1.18	1.38	1.17	1.01	0.88	0.79	12.3	14.2
11	0.82	.92	.99	1.08	1.28	.99	.77	----	----	17.7	23.4
13	----	----	1.05	1.20	1.31	----	----	----	----	9.8	10.2
17	----	.94	1.05	1.20	1.38	1.21	----	----	----	10.2	12.7
22	----	----	----	1.22	1.43	1.22	1.03	.88	.79	7.5	8.4
26	----	----	----	1.06	1.29	1.17	1.01	.90	.79	21.1	13.7
27	.83	.92	1.05	1.20	1.41	----	----	----	----	4.2	4.6
28	.88	.96	1.07	1.20	1.39	1.14	.96	.79	----	4.4	5.3
Averages	.84	.91	1.03	1.15	1.35	1.15	.96	.86	.79	----	----
Departures	+.10	+.07	+.06	+.01	-.04	.00	-.01	+.03	+.07	----	----

MADISON, WIS.

Date	A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
September										*Mb.*	*Mb.*
6	0.79	0.88	0.98	1.13	1.36	----	----	----	----	15.3	13.2
7	----	----	1.07	1.24	1.44	1.19	----	----	----	9.4	9.4
11	.69	.79	.95	1.10	1.24	.99	----	----	----	14.8	20.4
13	.81	.92	1.03	1.16	1.35	1.13	----	----	----	10.6	11.8
14	.73	.84	.96	----	----	----	----	----	----	11.8	11.8
17	.77	.88	1.01	1.14	1.38	1.11	----	----	----	10.2	12.3
18	.80	.88	1.01	1.11	1.40	1.16	----	----	----	10.2	10.6
19	.74	.80	.92	1.08	1.42	1.10	----	----	----	13.2	12.3
21	----	----	.70	.83	1.12	----	----	----	----	14.2	13.2
28	----	.99	1.13	1.26	1.47	----	----	----	----	5.6	5.1
Averages	.76	.87	.98	1.12	1.35	1.11	----	----	----	----	----
Departures	+.04	+.02	.00	-.01	-.01	-.03	----	----	----	----	----

BOSTON, MASS.

Date	A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
September										*Mb.*	*Mb.*
10	----	----	1.03	1.11	----	0.99	----	----	----		
19	----	----	----	1.17	----	----	----	----	----		
24	----	----	.94	1.06	----	----	----	----	----		
27	----	----	----	.96	----	----	----	----	----		
28	----	----	----	1.12	----	----	----	----	----		
29	----	----	----	1.31	----	1.31					
Averages	----	----	.99	1.12	----	1.15	----	----	----		
Departures	----	----	+.08	+.08	----	+.21					

*Extrapolated

ALBUQUERQUE, N.M.

Date	Sun's zenith distance, A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°	Vapor pressure, E.S.T. 7:30 a. m.	Vapor pressure, E.S.T. 1:30 p. m.
Air mass	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
September										*Mb.*	*Mb.*
1	1.03	1.13	1.25	1.39	1.55	1.43	1.29	1.18	1.08	7.6	6.5
2	1.00	1.11	1.22	1.35	1.48	1.43	1.24	1.15	----	7.0	7.6
3	----	1.05	1.15	----	----	----	----	----	----	8.5	8.5
4	----	----	1.09	1.24	----	1.42	1.27	1.17	1.09	8.5	9.1
5	1.05	1.15	1.27	1.41	1.46	1.43	1.28	1.18	1.09	3.0	6.0
6	1.01	1.13	1.24	1.40	1.52	1.40	----	----	----	4.6	4.8
9	.93	1.06	1.17	1.34	1.51	1.40	1.25	1.11	1.00	8.8	6.8
10	.93	1.05	----	1.31	1.54	1.41	1.24	1.13	1.01	8.5	8.8
11	----	----	----	1.30	----	----	----	----	----	9.1	7.3
12	.94	1.07	1.20	1.36	1.52	1.36	1.23	1.12	.99	2.2	2.1
13	.87	1.00	1.13	1.31	1.51	1.45	1.25	1.13	1.06	5.8	4.6
14	.80	.91	1.04	1.19	1.43	1.33	1.10	.95	.80	8.5	8.8
15	.85	1.00	1.12	1.31	1.48	1.28	1.00	.92	.75	7.3	6.8
16	.95	1.06	1.17	1.35	1.53	1.42	1.25	1.14	1.03	5.2	5.4
17	.84	.98	1.11	1.29	1.52	1.31	1.15	1.03	.93	5.6	3.2
18	.88	1.00	1.10	1.29	1.47	1.30	1.11	.96	.82	3.8	3.5
19	.80	.94	1.07	1.26	1.45	1.23	1.09	.94	.83	2.7	3.2
20	.89	1.02	1.16	1.32	1.53	----	----	----	----	3.0	4.2
21	----	----	----	----	1.16	1.34	----	----	----	4.8	6.3
22	.80	.92	1.06	1.20	1.47	1.26	1.06	.89	.76	6.8	6.3
23	.92	1.04	1.18	1.36	1.57	1.39	1.25	1.10	.99	3.5	3.8
24	.92	1.05	1.18	1.37	1.53	1.38	1.23	1.08	.96	3.0	3.8
25	.92	1.04	1.16	1.25	1.45	1.39	1.20	1.07	.96	3.3	4.6
26	1.02	1.13	1.25	1.42	1.57	1.43	1.25	1.15	1.05	3.8	3.3
27	1.04	1.15	1.27	1.41	1.53	1.42	1.22	1.11	.96	2.5	3.3
28	.75	.93	1.03	1.23	----	----	----	----	----	6.0	6.3
30	.98	1.08	1.22	1.36	----	----	1.19	1.11	1.01	8.8	8.5
Averages	.92	1.04	1.16	1.31	1.50	1.37	1.20	1.08	.96	---	---
Departures	+.06	+.07	+.07	+.07	+.01	+.10	+.08	+.07	+.05	---	---

BLUE HILL, MASS.

Date	A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°	7:30 a. m.	1:30 p. m.
Air mass	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
September										*Mb.*	*Mb.*
4	----	0.96	1.07	1.21	----	----	----	----	----	12.8	11.7
5	0.78	.86	.96	1.14	----	----	----	----	----	12.2	13.2
7	----	----	----	----	----	1.04	0.91	0.79	----	19.7	16.0
8	.79	.89	1.01	1.27	----	1.25	1.12	1.01	0.92	9.7	10.4
9	.82	.92	1.03	1.21	----	1.19	.92	.85	.72	9.4	13.0
10	.84	.96	1.06	1.23	----	1.14	----	----	----	13.7	15.2
12	----	----	----	----	----	1.03	.84	.72	----	20.1	15.4
13	----	----	----	----	----	----	.72	.59	.44	19.3	20.4
16	----	----	----	----	----	1.09	.96	.80	.68	17.5	18.0
19	.63	.71	.94	1.20	----	----	----	----	----	14.5	11.0
20	.62	.72	.89	1.05	----	.86	.64	.51	.40	12.8	17.5
24	.92	1.00	1.11	1.25	----	----	----	----	----	10.2	11.2
26	----	----	----	----	----	1.22	1.03	.84	.71	7.4	5.0
27	.62	.71	.83	1.05	----	----	----	----	----	9.9	14.9
28	----	----	----	1.18	----	----	----	----	----	10.2	7.5
29	1.02	1.12	1.23	1.37	----	1.37	1.21	1.08	.98	6.6	5.3
30	1.00	1.09	1.19	----	----	----	----	----	----	5.1	5.5
Averages	.80	.90	1.03	1.20	----	1.13	.93	.80	.69	----	----
Departures	+.03	+.03	+.03	+.07	----	.00	.00	.00	+.02	----	----

RATIO BOSTON/BLUE HILL ON COMPARABLE DATES

	A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°		
	----	----	0.91	0.93	----	0.91	----	----	----		

TACUBAYA, D. F., MEXICO

Date	A. M. 78.7°	A. M. 75.7°	A. M. 70.7°	A. M. 60.0°	0.0°	P. M. 60.0°	P. M. 70.7°	P. M. 75.7°	P. M. 78.7°	7:30 a. m.	1:30 p. m.
Air mass	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
										Mb.	*Mb.*

NO DATA DURING SEPTEMBER, 1951

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	3	4	5	6	7	8	9	Average	10	11	12	13	14	15	16	Average	17	18	19	20	21	22	23	Average
Langleys	65	370	379	233	335	372	412	310	403	158	389	369	364	207	305	314	324	118	421	397	326	421	69	297
Date	24	25	26	27	28	29	30	Average																
Langleys	353	256	469	348	412	483	197	360																

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	3	4	5	6	7	8	9	Average	10	11	12	13	14	15	16	Average	17	18	19	20	21	22	23	Average
Langleys	62	84	95	97	102	90	79	87	75	83	84	78	85	89	80	82	89	86	81	80	90	73	53	79
Date	24	25	26	27	28	29	30	Average																
Langleys	82	78	77	86	75	84	73	79																

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	3	4	5	6	7	8	9	Average	10	11	12	13	14	15	16	Average	17	18	19	20	21	22	23	Average
Langleys	104	100	129	177	165	111	70	122	62	188	92	130	146	173	141	133	169	179	74	96	162	87	86	122
Date	24	25	26	27	28	29	30	Average																
Langleys	123	138	64	152	99	47	141	109																

Note.—Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1951	Aklavik, MacKenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismarck, N.D.	Blue Hill, Mass.	Boston, Mass.	Brownsville, Tex.	Caribou, Me.	Charleston, S.C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio	Davis, Calif.
September 3--		628		463	567	55	269	163	106	85	656	66	324	451	114	292	
September 4--		662		485	592	34	117	428	532	487	662	524	443	609	103	482	
September 5--		669		489	519	44	192	520	532	475	639	519	452	433	207	475	
September 6--		654		442	410	79	(232)	571	304	302	621	396	353	370	610	349	
September 7--		556		454	632	40	350	350	447	473	526	225	589	129	512	444	
September 8--		457		623	625	53	374	272	498	435	558	587	657	515	508	510	
September 9--		653		158	587	15	219	444	536	508	606	426	567	495	50	545	
Averages------		611		445	562	46	(250)	393	422	395	610	392	484	429	301	442	
Departures----		+20		-5	---	---	+27	-27	+30	+17	+36	+16	+49	+23	-78	---	
September 10--		653		581	---	23	44	456	524	491	636	535	549	328	617	264	
September 11--		628		287	---	19	150	285	216	279	(462)	358	528	568	578	545	
September 12--		(659)		477	---	27	313	400	472	519	(275)	516	504	558	172	523	
September 13--		649		480	367	44	124	258	432	442	212	510	572	192	623	141	
September 14--		616		215	134	22	184	419	465	414	249	345	383	572	599	565	
September 15--		627		301	---	49	173	464	282	248	338	56	(295)	542	138	541	
September 16--		640		196	399	48	158	530	362	371	278	374	(215)	448	545	485	
Averages------		(639)		362	---	33	164	402	393	395	(350)	385	(435)	458	468	438	
Departures----		+60		-87	---	---	-45	+30	+26	+63	-168	+13	-4	+69	+34	---	
September 17--		630		112	225	47	154	494	384	359	626	443	157	541	602	535	
September 18--		618		121	---	37	171	499	190	208	609	547	172	441	545	522	
September 19--		602		343	489	31	81	347	482	463	645	361	315	503	523	442	
September 20--		596		115	---	35	118	286	450	449	403	542	493	459	552	464	
September 21--		459		412	182	34	89	352	372	315	585	432	407	483	509	462	
September 22--		585		556	242	44	180	200	467	434	311	399	425	509	590	97	
September 23--		605		546	355	34	323	366	99	143	517	177	535	113	452	526	
Averages------		585		315	299	37	159	363	349	339	528	414	358	435	539	435	
Departures----		+45		-123	---	---	-29	+17	-2	+41	+21	+89	-60	+58	+83	---	
September 24--		594		577	---	30	320	124	403	390	577	428	466	371	312	318	
September 25--		585		562	315	20	(252)	199	286	283	531	106	180	305	268	133	
September 26--		594		513	---	26	240	179	503	448	655	521	445	355	494	334	
September 27--		594		374	---	29	206	302	379	360	584	262	463	(399)	494	502	
September 28--		509		384	---	23	267	475	449	445	576	364	386	326	564	388	
September 29--		337		427	521	54	200	335	520	488	500	212	341	490	403	473	
September 30--		564		220	444	17	92	376	248	240	558	430	556	127	383	316	
Averages------		540		437	---	29	(225)	284	398	379	569	332	405	(339)	417	352	
Departures----		+38		+13	---	---	+61	-28	+54	+70	+85	+23	+32	+2	+6	---	
Accumulated Departures January 1 to September 30, 1951		+1344		+455	---	---	-2849	---	+1260	+1799	---	---	---	---	---	---	

1951	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Junction, Colo	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Indianapolis, Ind.	Ithaca, N.Y.	Keflavik, Iceland	Lake Charles, La.	Las Vegas, Nev.
September 3--	449	168	380	676	622		625	---		291	667	672	499	561	468	496	273	295	106	524	588
September 4--	494	473	511	661	645		618	---		273	669	578	369	576	159	636	329	568	368	402	621
September 5--	368	437	474	608	499		559	---		514	654	535	265	619	668	713	285	513	262	401	593
September 6--	366	364	488	661	632		577	---		597	641	594	306	384	551	709	415	66	338	277	597
September 7--	441	465	355	(648)	634		576	---		552	641	628	543	639	520	517	553	173	125	499	579
September 8--	410	395	314	416	627		518	---		395	633	575	499	619	644	536	437	571	126	493	570
September 9--	477	509	392	582	633		431	---		455	656	530	548	587	668	612	467	585	95	424	552
Averages------	429	402	416	(608)	613		558	---		440	652	587	433	569	525	603	394	396	203	431	587
Departures----	+68	-2	+70	-2	+70		+59	---		+24	---	+75	---	+112	+33	+4	+2	+16	---	-41	+20
September 10--	49	501	192	603	623		489	---		510	650	624	530	466	605	625	161	520	117	223	562
September 11--	444	459	167	647	627		559	---		327	470	484	342	322	532	646	552	435	74	587	549
September 12--	441	429	315	635	629		444	564		383	643	599	409	536	245	668	479	518	223	214	557
September 13--	180	414	450	625	613		491	554		494	633	620	438	457	610	589	322	509	215	145	599
September 14--	348	503	462	623	602		658	551		431	624	612	185	163	586	715	517	87	279	152	597
September 15--	258	441	450	626	589		646	537		564	623	563	231	274	264	647	414	462	148	504	580
September 16--	351	250	404	555	588		343	521		550	643	602	289	314	136	605	462	219	245	542	574
Averages------	296	428	349	616	610		518	545		466	612	586	346	362	425	642	415	393	186	338	574
Departures----	+31	+61	+9	+38	+99		+40	+11		+78	---	+100	---	-71	-29	+41	+9	+48	---	-102	+9
September 17--	383	287	434	644	588		663	537		541	604	604	175	152	251	367	534	431	156	598	555
September 18--	440	193	220	658	424		637	363		523	483	354	252	337	132	438	498	375	291	602	507
September 19--	372	436	185	641	572		649	518		309	572	474	398	500	274	386	479	497	84	603	529
September 20--	342	422	246	622	465		620	521		231	566	207	475	443	579	509	452	483	68	385	517
September 21--	377	400	122	612	555		579	535		398	531	373	509	207	393	309	353	456	73	49	538
September 22--	124	406	256	583	577		556	531		166	584	436	313	332	529	620	198	343	89	250	552
September 23--	410	113	281	559	538		(573)	534		241	551	413	395	346	374	541	508	320	108	546	542
Averages------	350	322	249	617	531		(611)	505		344	556	409	360	331	362	453	432	415	124	433	534
Departures----	+52	-1	-48	+55	+40		+122	+11		-28	---	-38	---	-74	-44	-138	+43	+57	---	+7	-8
September 24--	191	428	196	587	538		599	518		236	532	529	491	498	568	593	144	340	110	405	542
September 25--	250	214	120	597	539		542	528		353	532	509	394	344	440	632	270	130	139	128	541
September 26--	81	472	223	(601)	529		537	516		296	564	536	437	291	538	471	212	454	231	448	541
September 27--	282	415	368	603	545		208	510		510	561	539	280	329	203	555	496	198	72	242	537
September 28--	280	415	216	556	129		104	466		471	242	405	504	555	332	662	496	206	171	445	282
September 29--	419	471	339	560	448		443	510		390	301	135	499	512	296	518	462	334	213	564	448
September 30--	154	287	177	552	529		569	500		321	522	471	489	521	576	632	217	92	53	569	505
Averages------	237	386	234	(579)	465		429	507		368	465	446	442	436	422	580	328	251	141	400	485
Departures----	-33	+42	-5	+31	-19		-18	+40		+25	---	+35	---	+44	+50	+26	-41	-68	---	-14	-27
Accumulated Departures January 1 to September 30, 1951	-5229	-3087	---	---	---		---	---		---	---	+2268	---	---	---	+3087	---	-84	---	-98	-1988

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33 -Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. – Continued

SEPTEMBER 1951

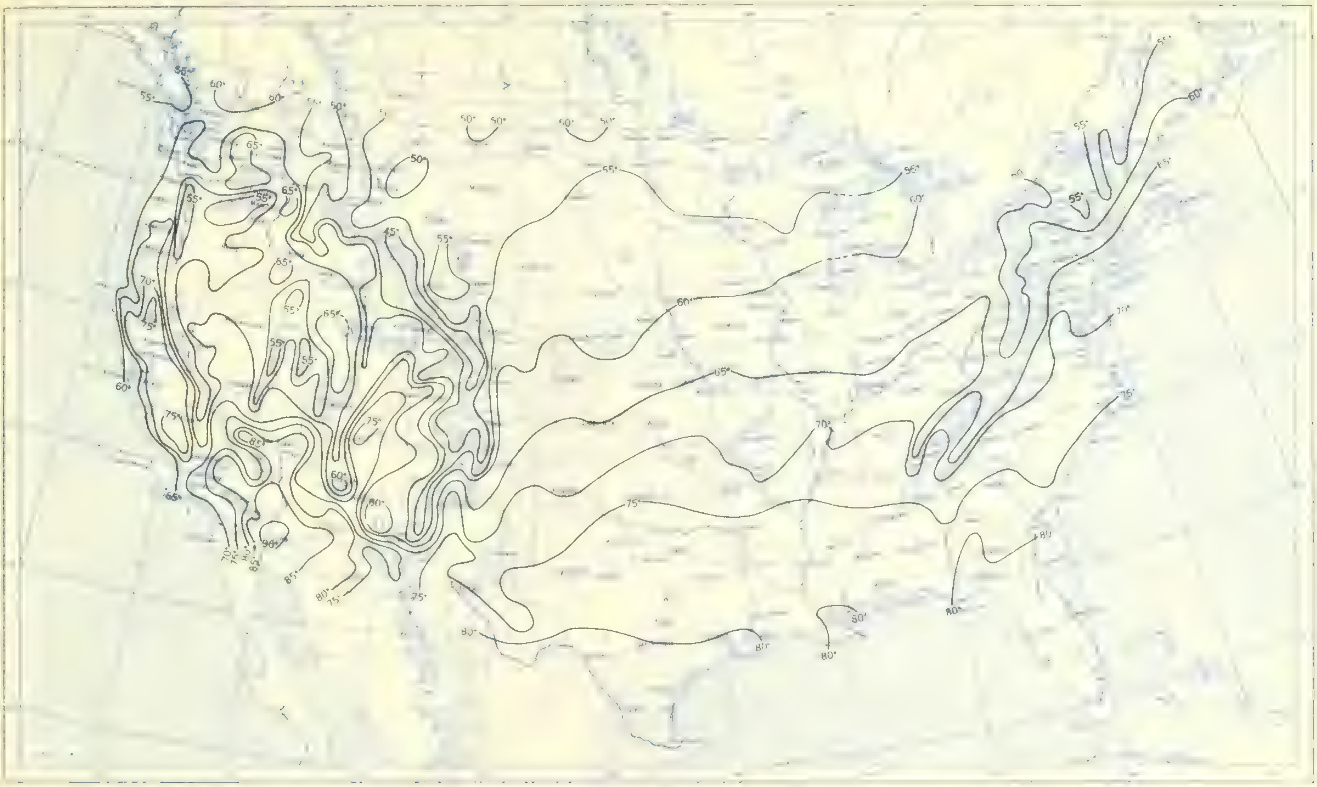
1951	Lincoln, Nebr.	Little Rock, Ark.	Lynn, Mass.	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R. I.	New York, N. Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T.H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S. D.	Riverside, Calif.	St. Cloud, Minn.
September 3--	250	325	134	542	605	639	548	429		---	559	264	610	642	487	188	627	
September 4--	56	559	543	480	586	502	478	606		201	493	582	611	642	605	264	647	
September 5--	118	359	505	246	566	606	493	554		174	478	604	666	648	498	589	613	
September 6--	510	498	309	470	470	608	410	389		141	408	44	677	623	408	569	595	
September 7--	246	400	475	573	565	626	548	533		213	621	272	503	633	264	512	571	
September 8--	203	469	455	540	607	427	539	608		506	500	560	549	630	514	528	578	
September 9--	196	273	529	236	594	359	584	582		550	580	583	575	632	573	494	563	
Averages------	226	412	422	441	571	538	514	529		298	520	416	599	636	478	449	599	
Departures----	-209	---	+27	+57	+55	---	+111	+93		-79	+100	+43	+35	+55	+37	+23	+105	
September 10--	523	465	484	492	571	301	289	563		497	247	514	631	626	203	564	574	
September 11--	501	557	232	535	590	348	543	456		393	437	397	621	615	590	274	528	
September 12--	225	459	475	249	(580)	(368)	486	444		459	499	521	558	618	561	415	545	
September 13--	468	296	425	546	503	528	139	510		514	272	500	465	607	134	488	462	
September 14--	448	603	404	441	531	597	571	555		137	145	136	581	614	557	392	534	
September 15--	371	574	---	364	498	296	573	420		136	599	408	464	596	539	551	466	
September 16--	517	323	---	505	269	423	556	367		230	556	395	581	596	498	538	501	
Averages------	436	468	404	447	(506)	(409)	451	474		338	394	410	557	610	440	460	516	
Departures----	+20	---	+32	+102	+10	---	+63	+86		+20	-25	+52	+15	+40	+58	+59	+43	
September 17--	506	559	448	490	524	620	528	278		267	425	439	500	604	557	523	501	
September 18--	292	---	242	506	521	534	570	194		166	562	532	367	601	463	254	503	
September 19--	303	---	519	486	491	580	529	465		167	542	94	465	592	506	445	490	
September 20--	467	---	445	392	521	504	480	482		480	505	392	546	590	458	163	516	
September 21--	22	---	250	292	518	524	352	449		460	493	419	401	571	449	345	494	
September 22--	489	---	395	198	454	590	246	479		124	68	369	397	581	217	264	509	
September 23--	161	---	150	399	(504)	668	488	161		110	320	317	448	595	528	155	445	
Averages------	320	---	350	395	(505)	574	456	359		253	416	366	446	591	454	307	494	
Departures----	-82	---	+23	+41	+52	---	+64	+5		-15	+13	+44	-102	+37	+102	-105	+37	
September 24--	13	---	337	145	(394)	600	155	510		174	333	156	534	575	264	485	417	
September 25--	22	---	235	464	247	570	200	235		316	267	292	570	585	366	324	347	
September 26--	460	---	425	109	502	660	454	523		449	379	443	601	581	270	500	478	
September 27--	474	---	353	172	473	497	173	430		94	223	250	600	542	509	488	443	
September 28--	456	---	406	485	174	362	508	453		85	531	304	615	567	390	475	276	
September 29--	145	---	433	343	174	410	546	522		56	524	478	467	232	537	474	513	
September 30--	239	---	18	190	117	336	516	304		156	502	144	603	524	98	393	501	
Averages------	259	---	315	273	(297)	491	365	425		190	394	295	570	515	348	448	425	
Departures----	-98	---	+4	-31	-67	---	+11	+81		-34	+24	+7	+34	-17	+5	+55	-17	
Accumulated Departures January 1 to September 30, 1951	-9338	---	---	-4543	+2359	---	+6902	+2618		---	+2545	---	+5845	---	---	---	+5838	

1951	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle (U. of W.), Wash.	Seattle (WBAS), Wash.	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Thule, Greenland	Toronto, Ont.	Upton, N. Y.	Wake Island, Pacific Area	Washington (WBCO), D. C.	Winnipeg, Manitoba
September 3--	541	625	596	577	303	211	127	516	513	576	215	577	328		343	342		226	561
September 4--	574	519	514	573	618	446	539	556	556	567	539	554	558		509	614		459	252
September 5--	553	610	584	473	583	470	500	445	429	621	498	534	(660)		490	559		402	211
September 6--	531	653	522	110	252	61	164	267	257	450	203	252	309		134	276		180	438
September 7--	533	601	615	583	464	329	493	233	203	285	385	45	509		351	529		559	280
September 8--	553	518	636	570	610	515	594	351	416	388	583	413	(581)		511	619		---	294
September 9--	561	602	585	345	540	501	493	504	525	539	545	145	(606)		493	548		---	472
Averages------	550	590	579	461	481	362	416	410	414	489	424	360	(487)		404	498		(365)	358
Departures----	+57	---	+52	+59	+74	---	+5	-4	---	+3	+51	-63	---		+12	+104		---	-19
September 10--	546	570	543	38	547	468	560	208	206	222	520	571	(632)		365	555		(578)	372
September 11--	486	504	492	535	316	178	318	376	468	549	449	509	675		424	318		(413)	129
September 12--	520	339	519	(303)	417	414	461	498	500	529	508	140	551		474	471		(500)	358
September 13--	510	95	471	338	479	394	399	492	506	513	430	573	646		274	472		320	143
September 14--	497	266	579	(305)	543	282	483	492	496	520	131	553	(588)		383	511		313	172
September 15--	517	290	584	321	184	380	140	456	464	506	475	556	(530)		439	166		507	477
September 16--	515	508	547	417	551	340	494	432	407	424	303	531	678		355	533		483	479
Averages------	513	367	534	(322)	434	351	408	422	435	466	402	489	(614)		388	432		(445)	304
Departures----	+56	---	+2	-10	+67	---	+39	+50	---	+13	+19	+86	---		+62	+67		---	-14
September 17--	497	656	499	428	262	377	300	426	398	327	451	536	549		362	(291)		318	490
September 18--	399	650	463	505	189	338	280	240	252	470	427	552	632		486	269		306	452
September 19--	472	636	579	457	410	447	427	330	347	436	461	455	495		431	(424)		435	246
September 20--	362	639	548	274	460	374	464	404	461	457	430	470	509		360	454		478	266
September 21--	484	530	538	160	445	365	501	372	381	446	447	512	(344)		378	441		487	282
September 22--	503	516	516	138	477	381	388	300	327	236	360	562	(219)		150	500		462	182
September 23--	411	256	499	323	198	353	332	126	171	371	423	595	(337)		359	(249)		448	216
Averages------	447	555	520	326	349	376	384	314	334	392	429	526	(441)		361	(375)		419	305
Departures----	+12	---	-3	+64	+16	---	+29	+6	---	-15	+96	+85	---		+69	+22		---	-9
September 24--	388	438	343	255	504	328	491	71	54	188	194	572	625		194	521		491	---
September 25--	461	406	147	315	102	99	244	82	156	267	149	506	635		318	(407)		302	---
September 26--	455	453	248	35	516	443	502	380	398	462	461	470	(637)		210	509		441	---
September 27--	442	492	489	149	364	146	318	120	140	378	233	526	639		398	403		221	---
September 28--	221	338	539	296	504	391	485	238	218	188	282	493	598		312	482		505	---
September 29--	443	519	504	392	517	438	508	144	143	225	488	576	583		436	498		504	---
September 30--	449	571	534	38	360	164	468	217	198	92	222	566	(600)		100	373		474	---
Averages------	409	459	401	211	409	287	431	179	187	257	290	530	(617)		281	(456)		420	---
Departures----	+18	---	-89	-8	+65	---	+90	-62	---	-74	-34	+109	---		-15	+104		---	---
Accumulated Departures January 1 to September 30, 1951	+392	---	-2345	---	+1393	---	+2023	---	---	-840	+1960	---	---		-686	+4886		---	---

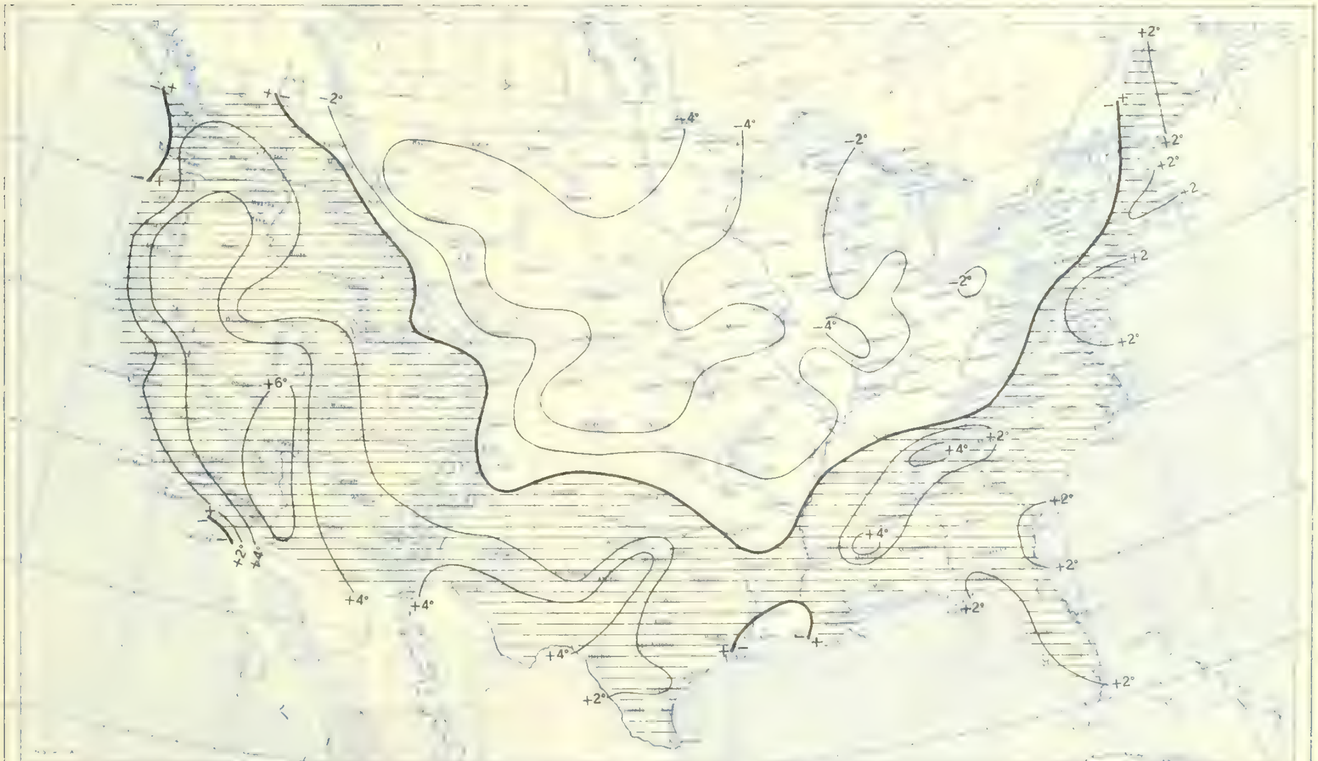
Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

W.B.T.U., New Orleans, Louisiana --- 2/8/52 --- 2200

Chart I. A. Average Temperature (°F.) at Surface, September 1951.

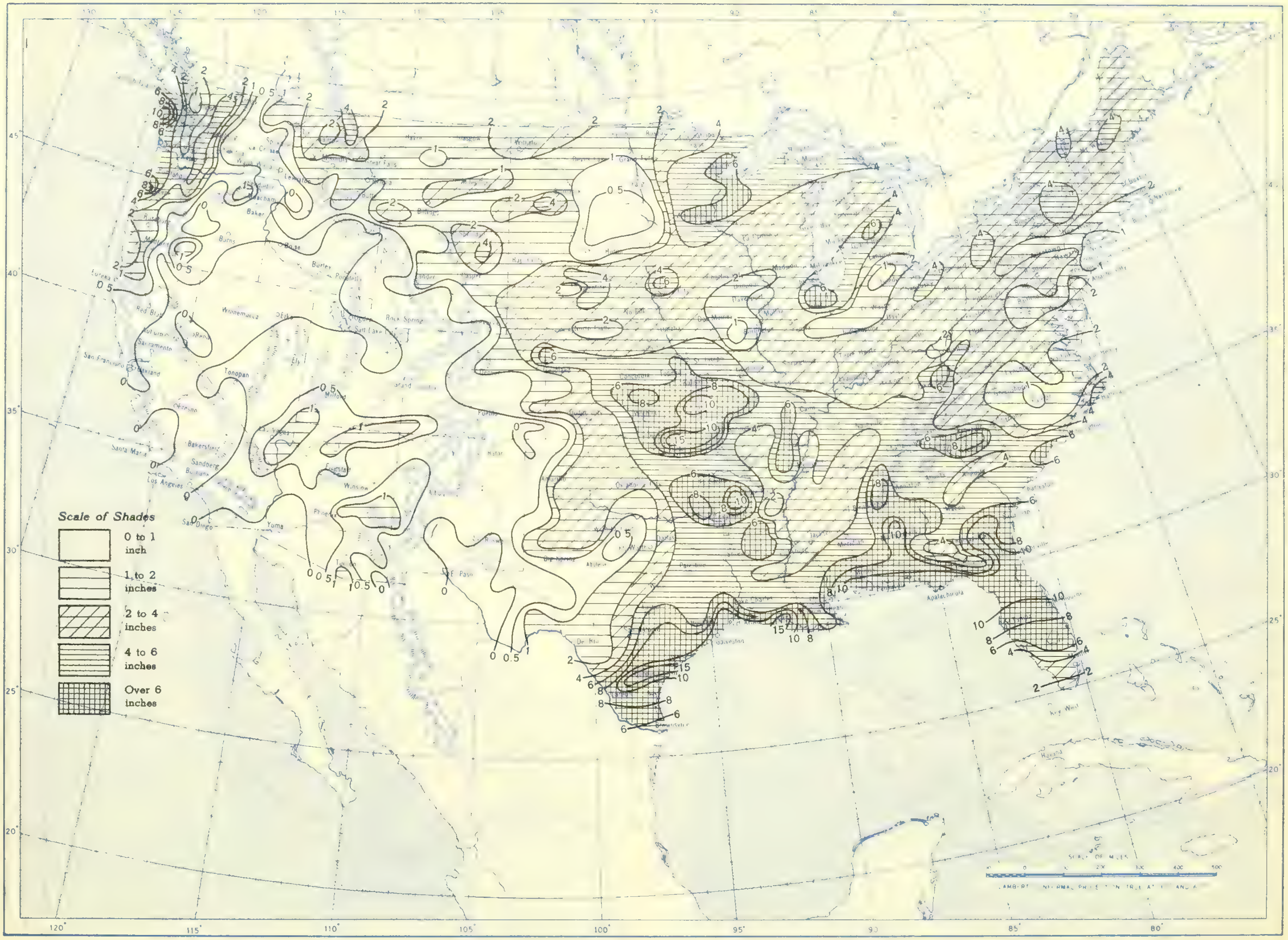


B. Departure of Average Temperature from Normal (°F.), September 1951.



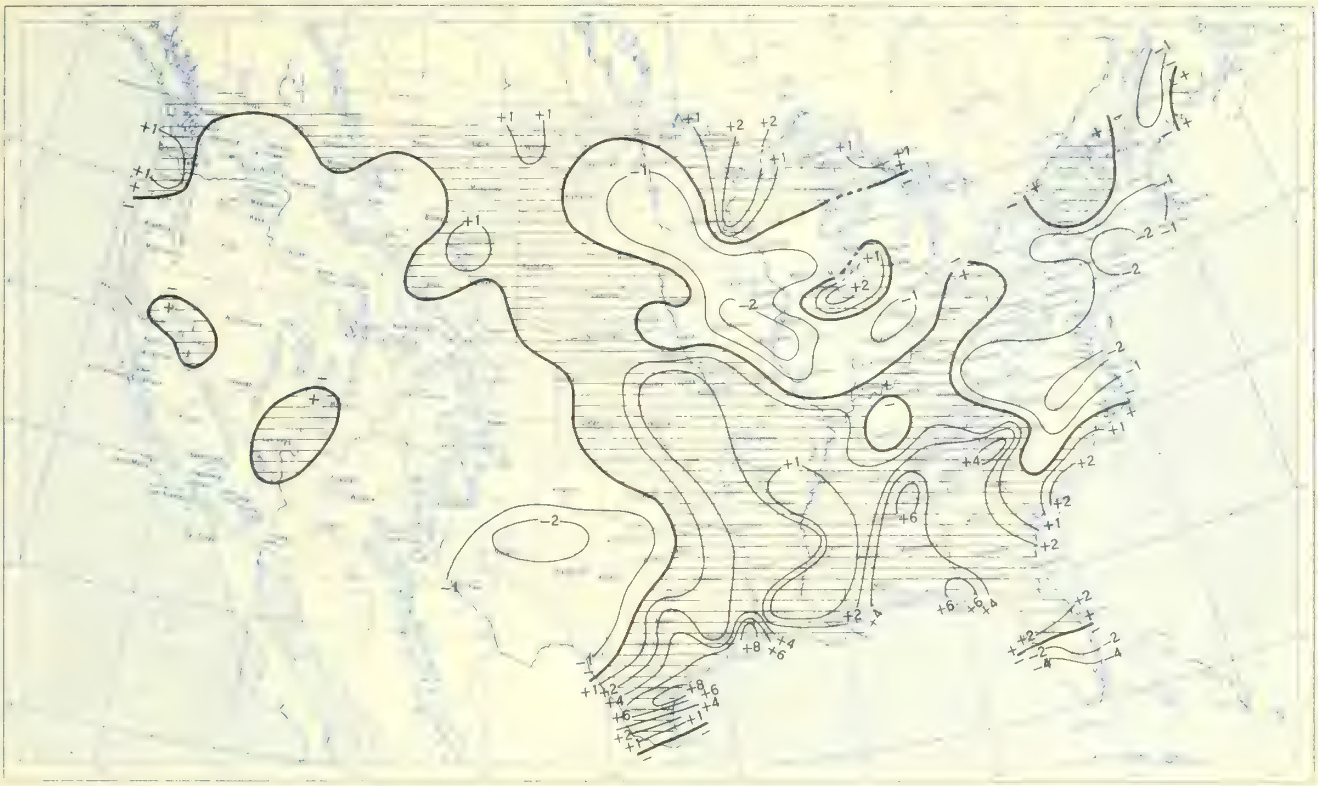
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), September 1951.

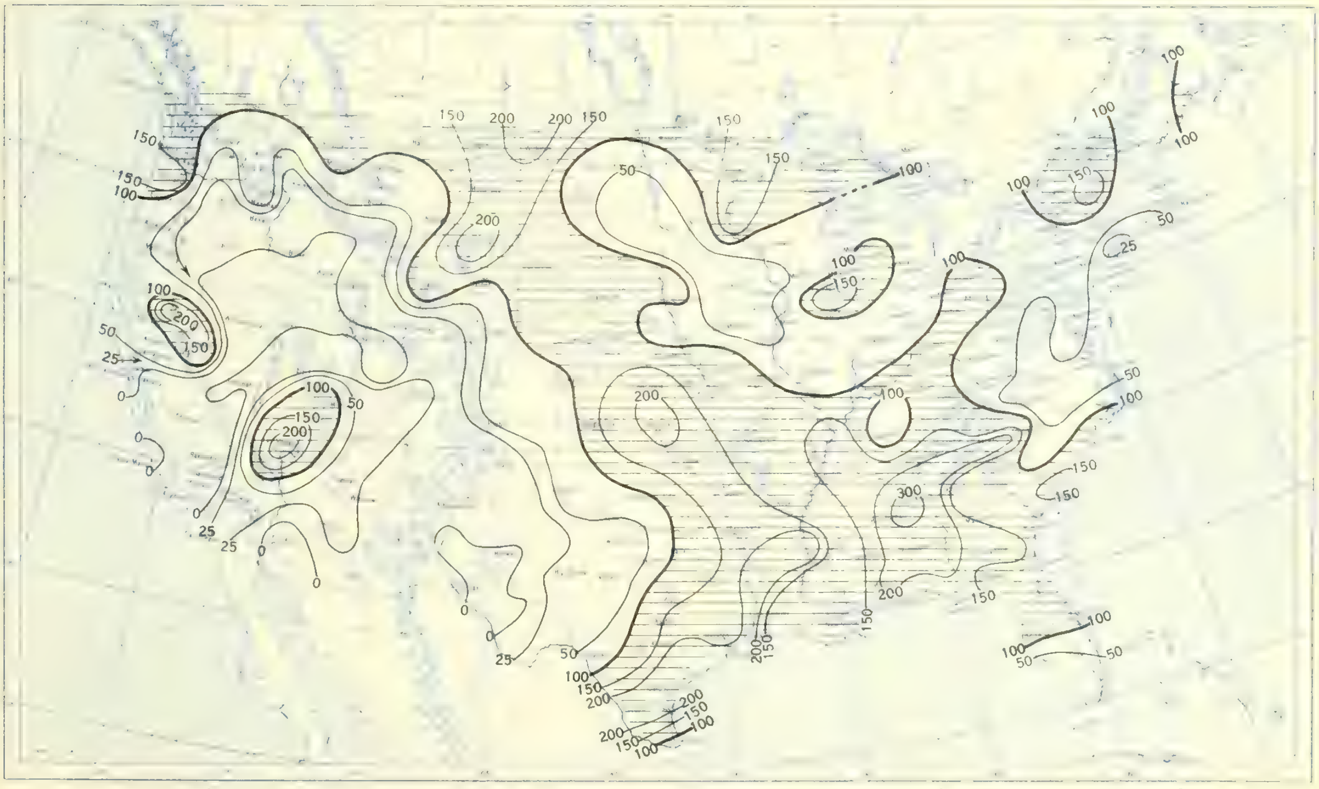


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), September 1951.

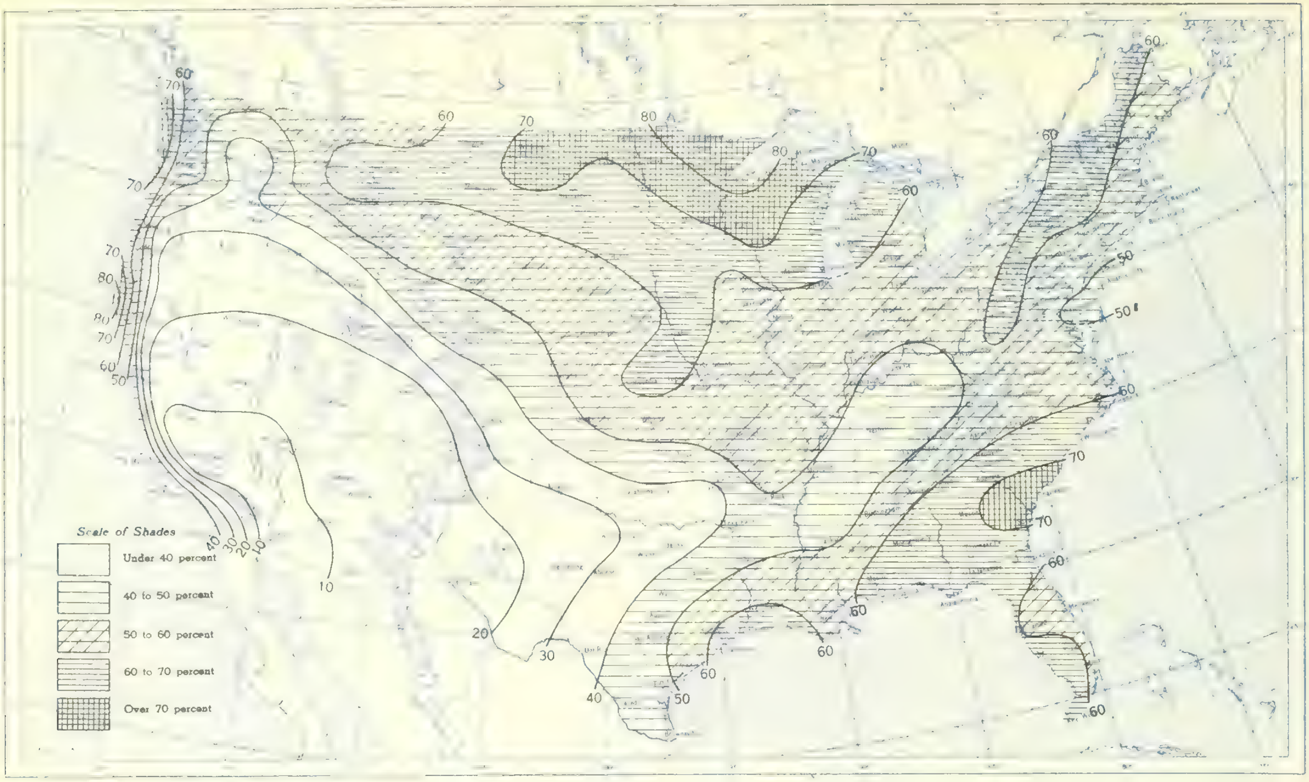


B. Percentage of Normal Precipitation, September 1951.

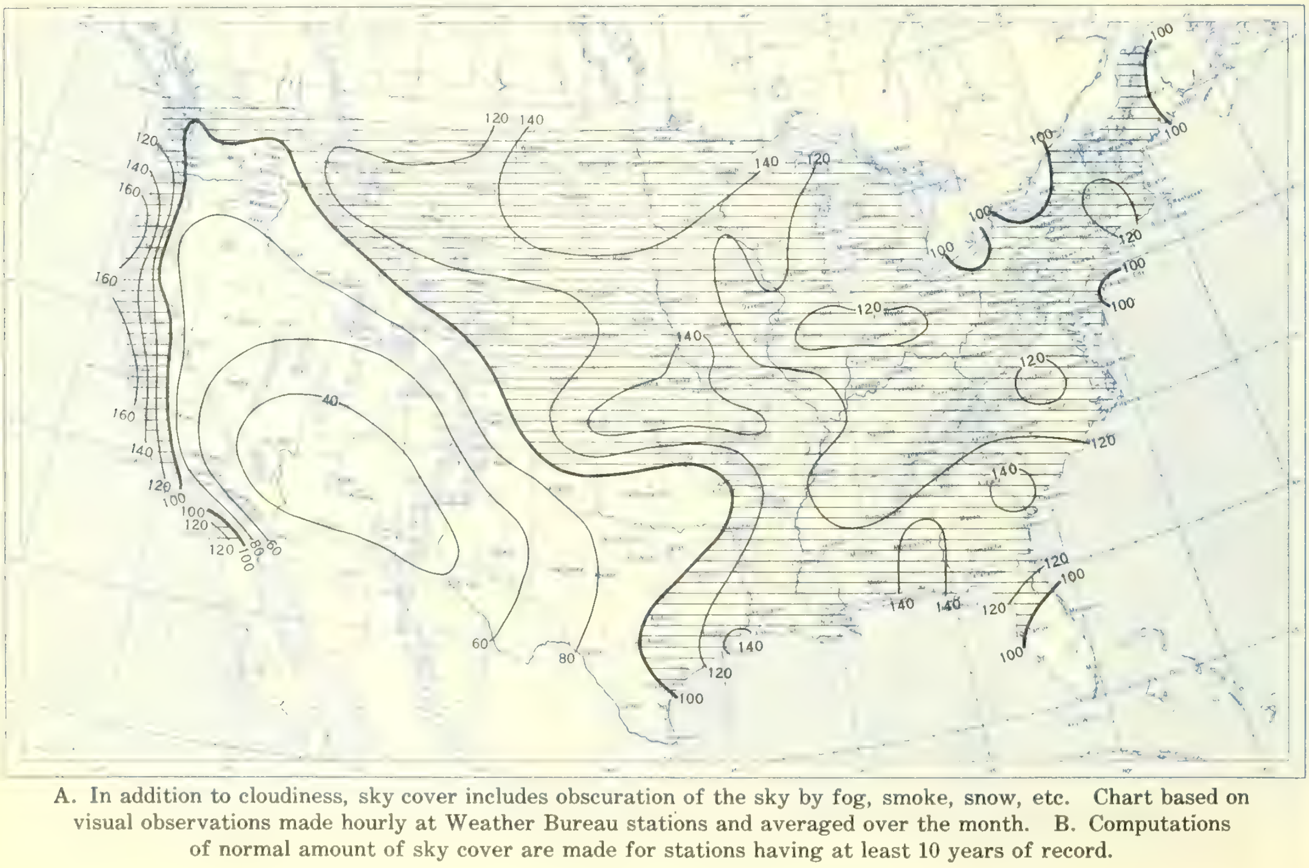


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, September 1951.

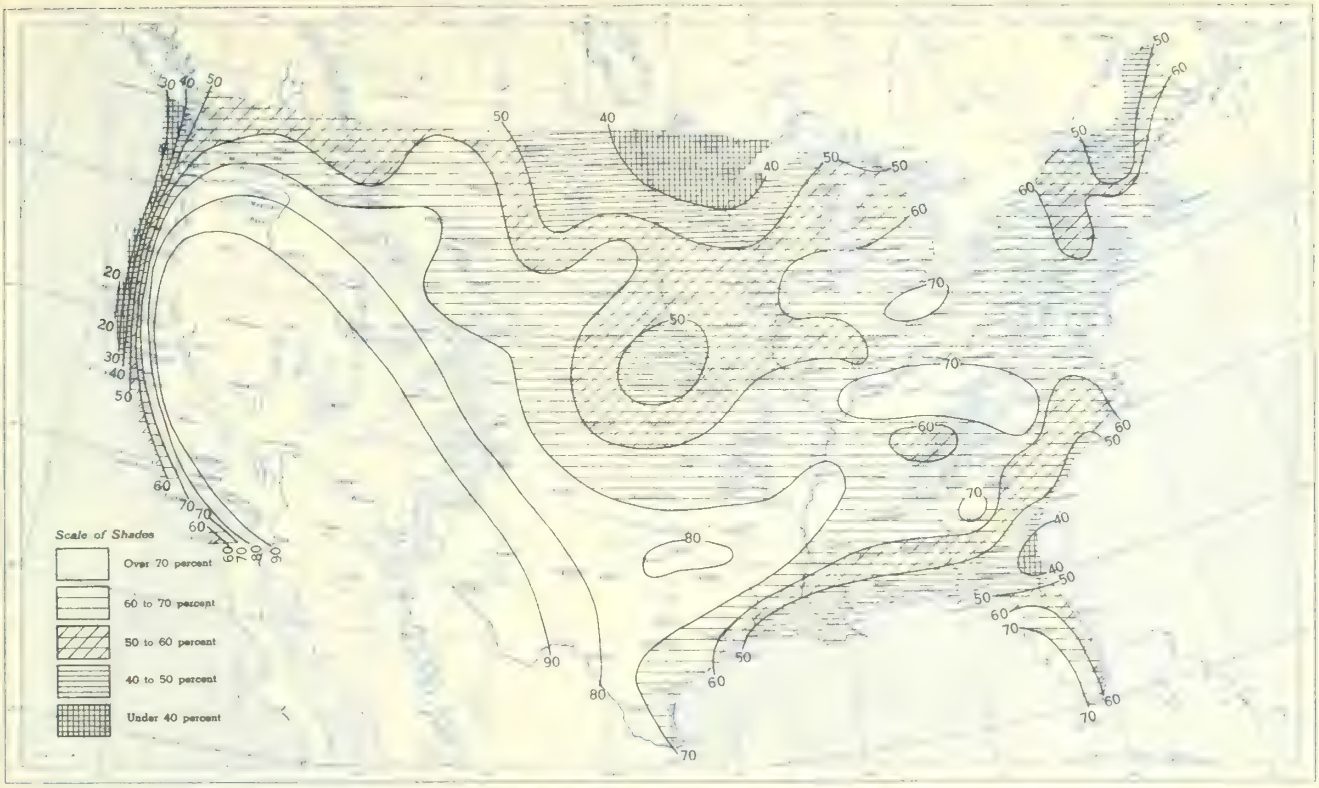


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, September 1951.

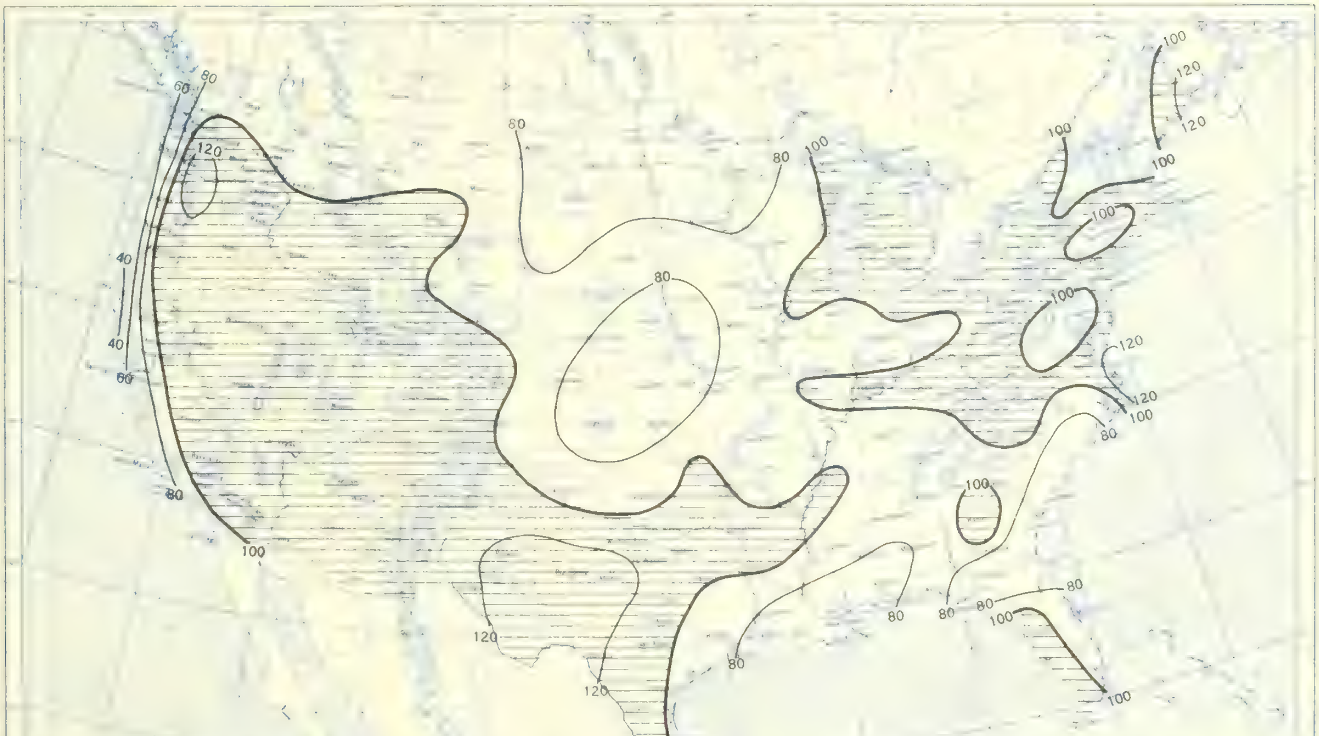


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, September 1951.



B. Percentage of Normal Sunshine, September 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, September 1951. Inset: Percentage of Normal Average Daily Solar Radiation, September 1951.

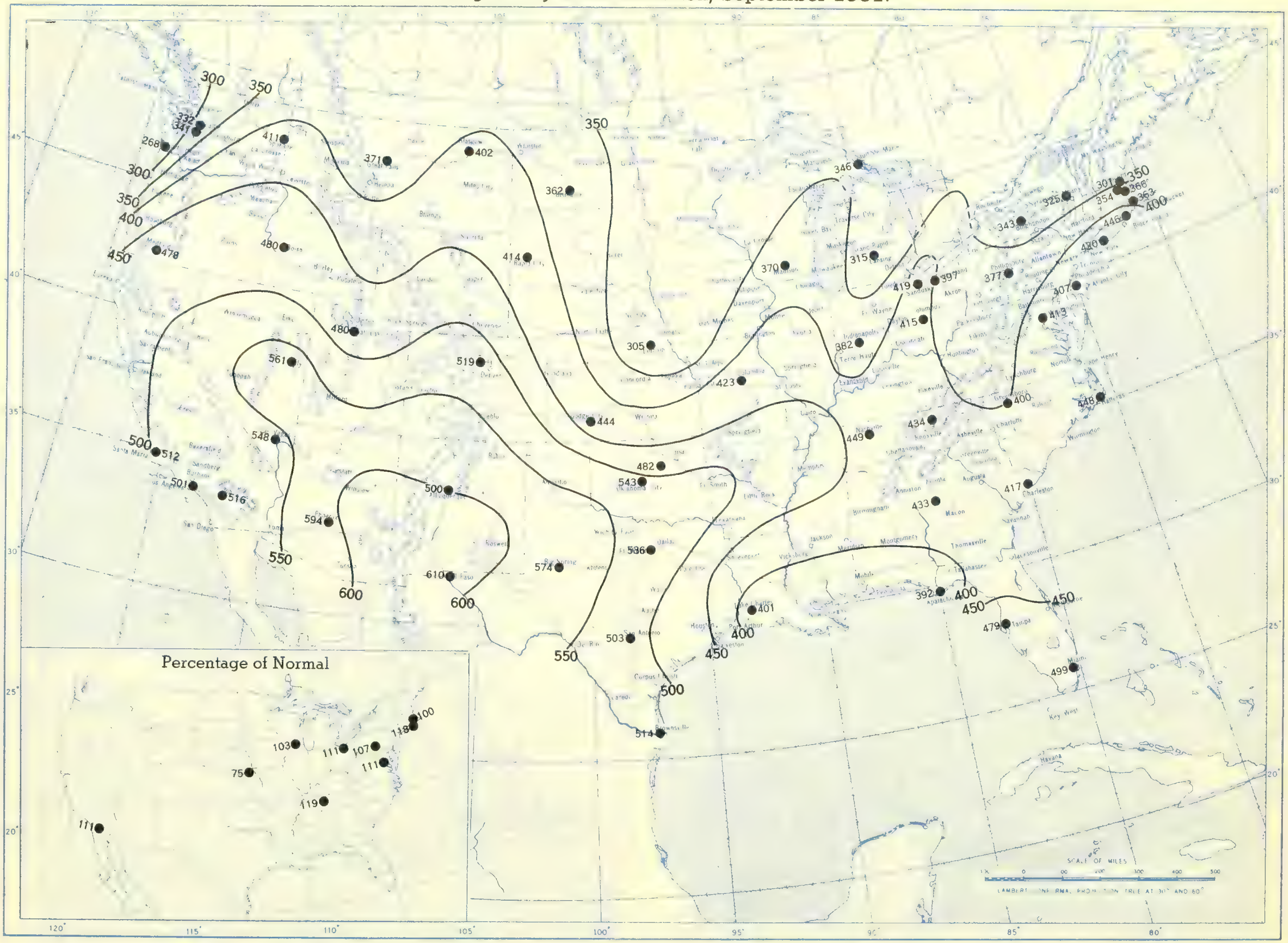
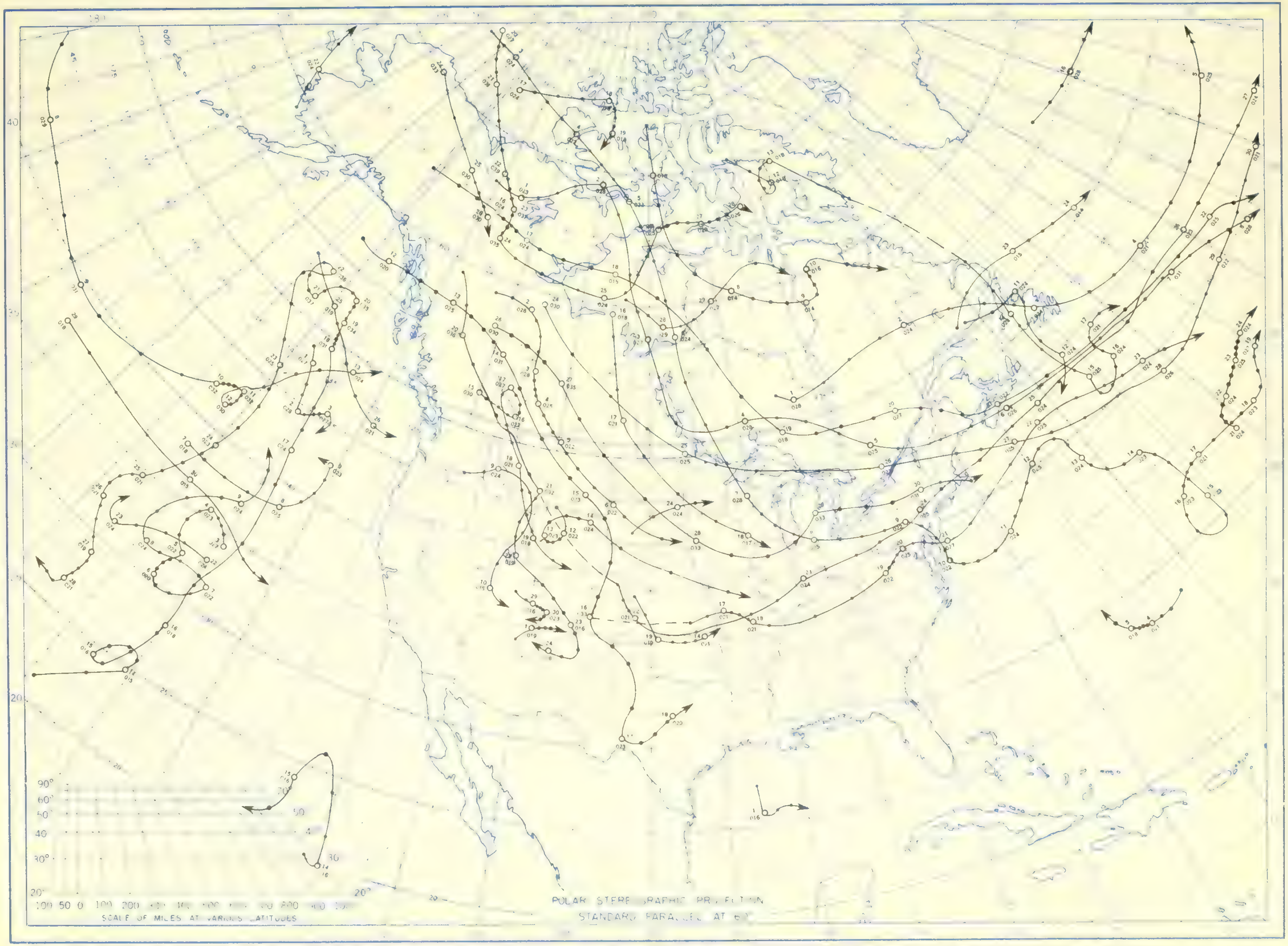


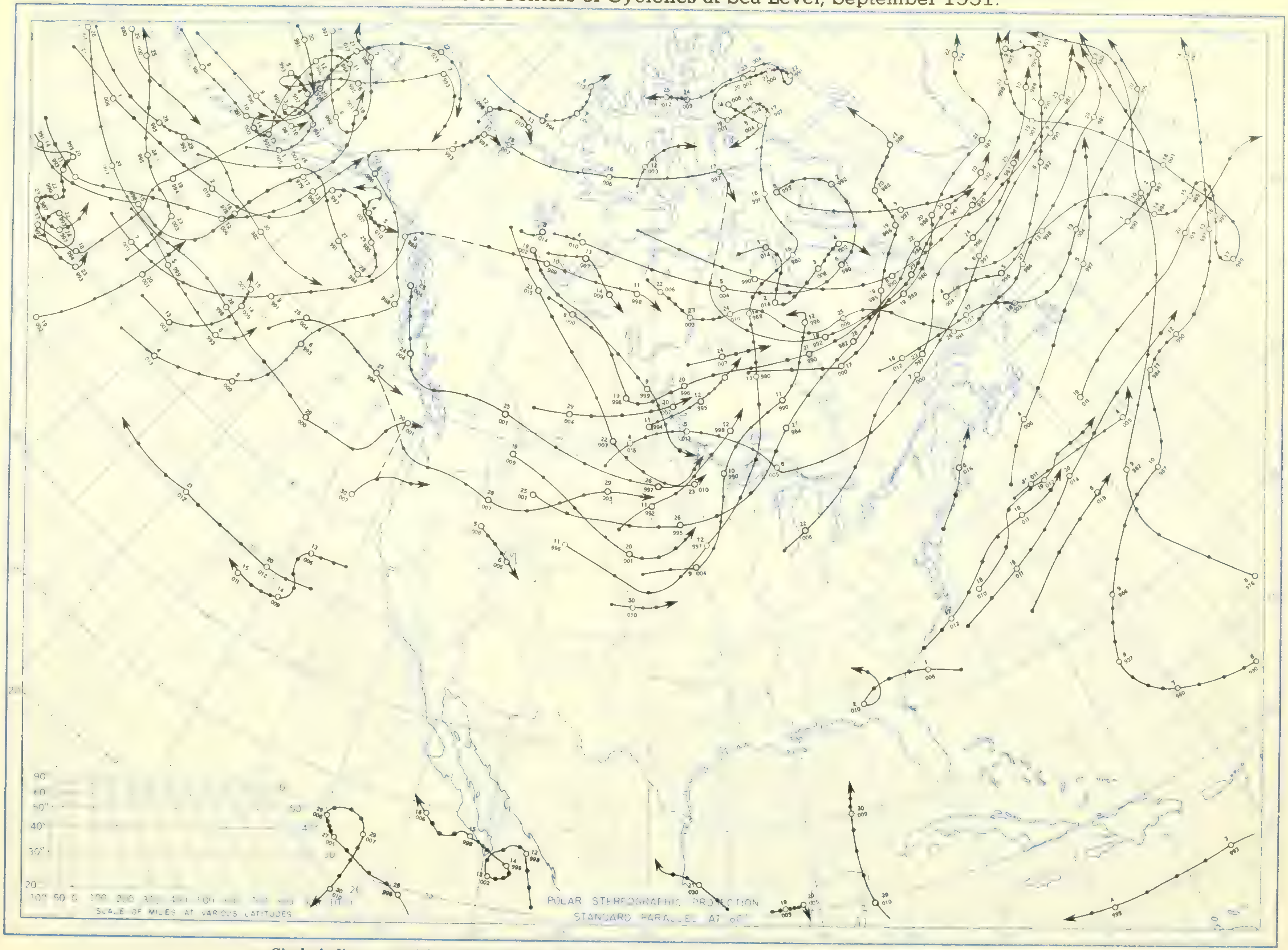
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart IX. Tracks of Centers of Anticyclones at Sea Level, September 1951


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES
90°
60°
50°
40
30°
20°

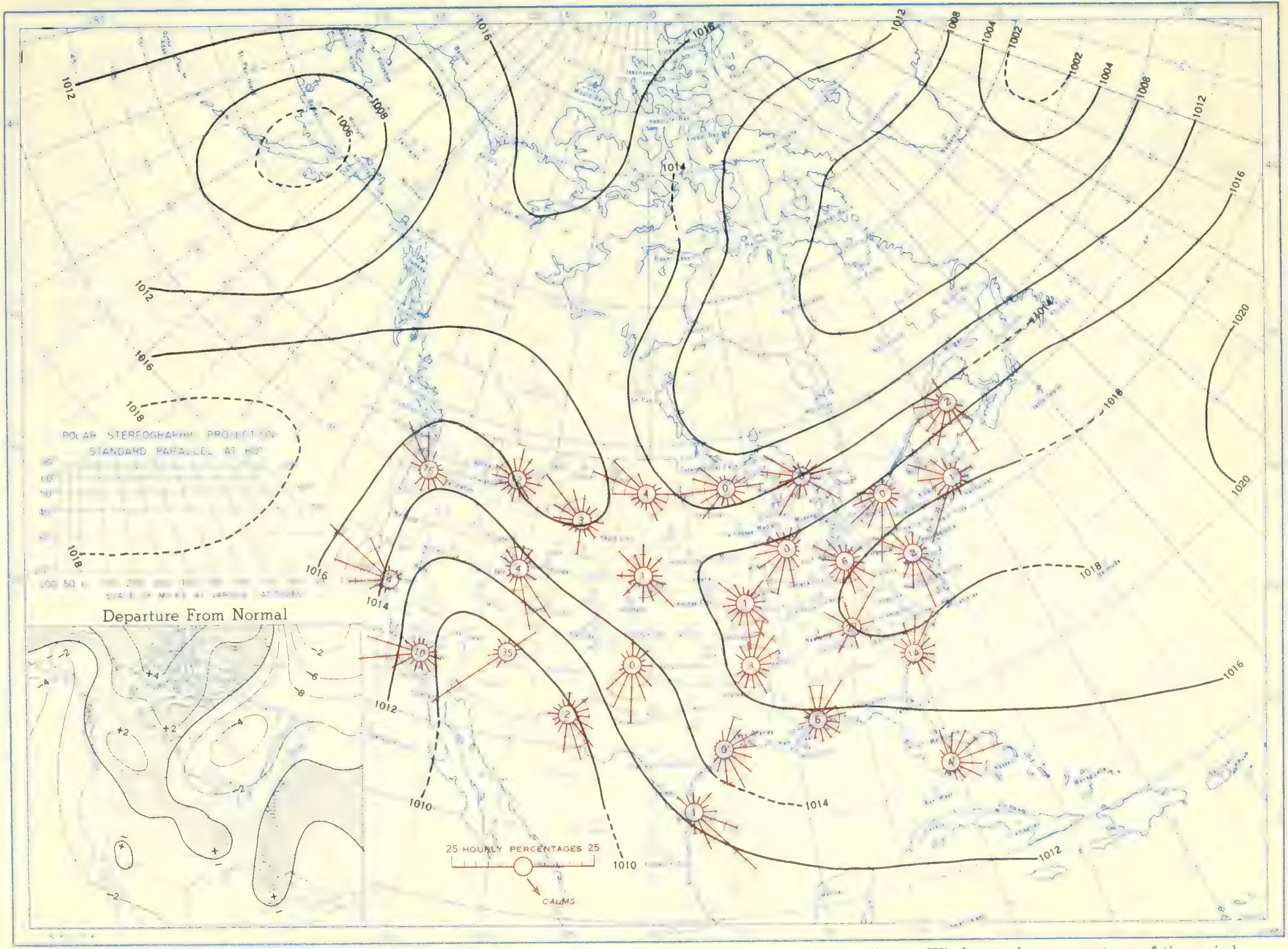
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, September 1951.


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES
90°
60°
50°
40°
30°
20°

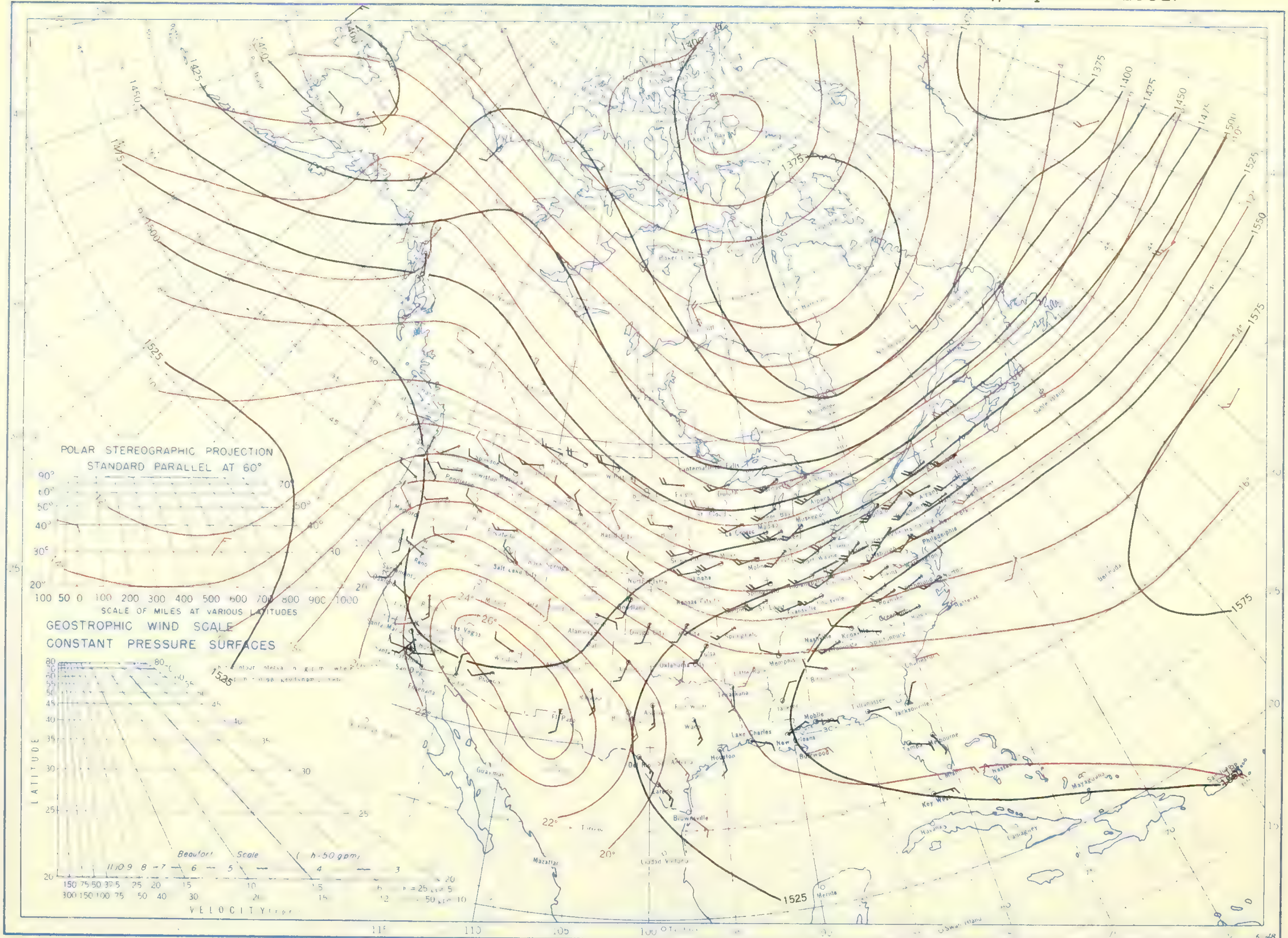
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, September 1951. Inset: Departure of Average Pressure (mb.) from Normal, September 1951.



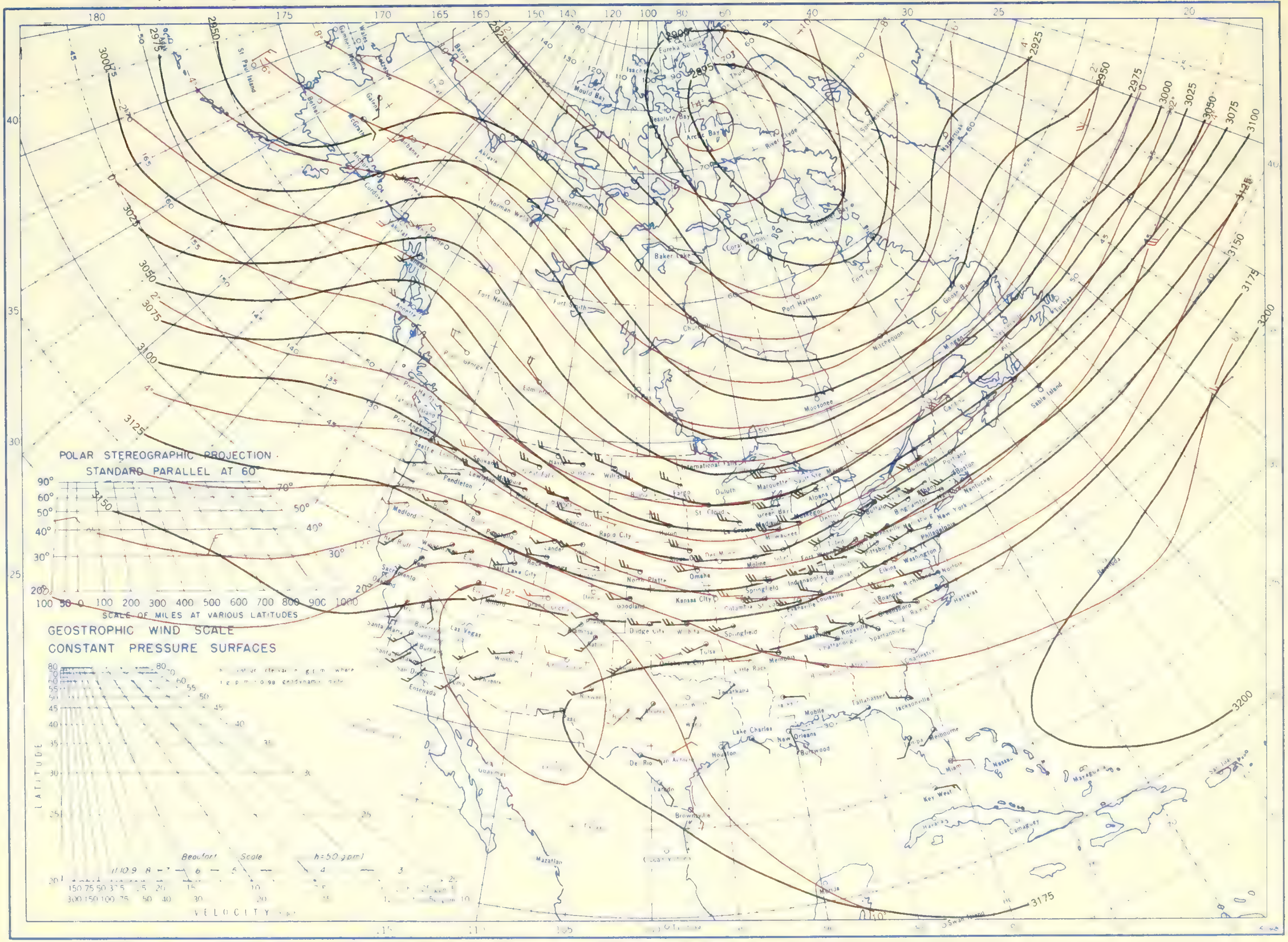
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899 1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), September 1951.



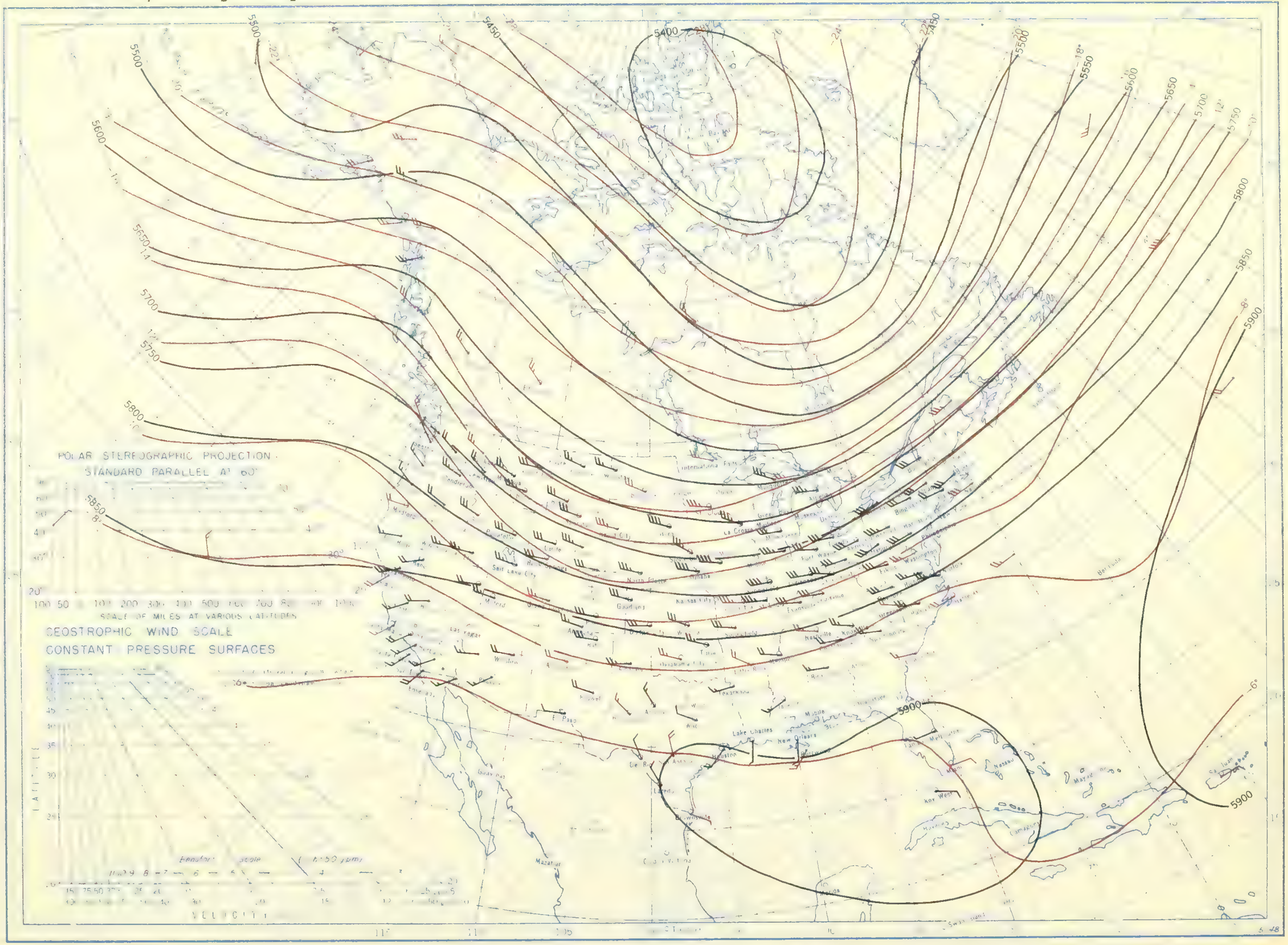
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), September 1951.



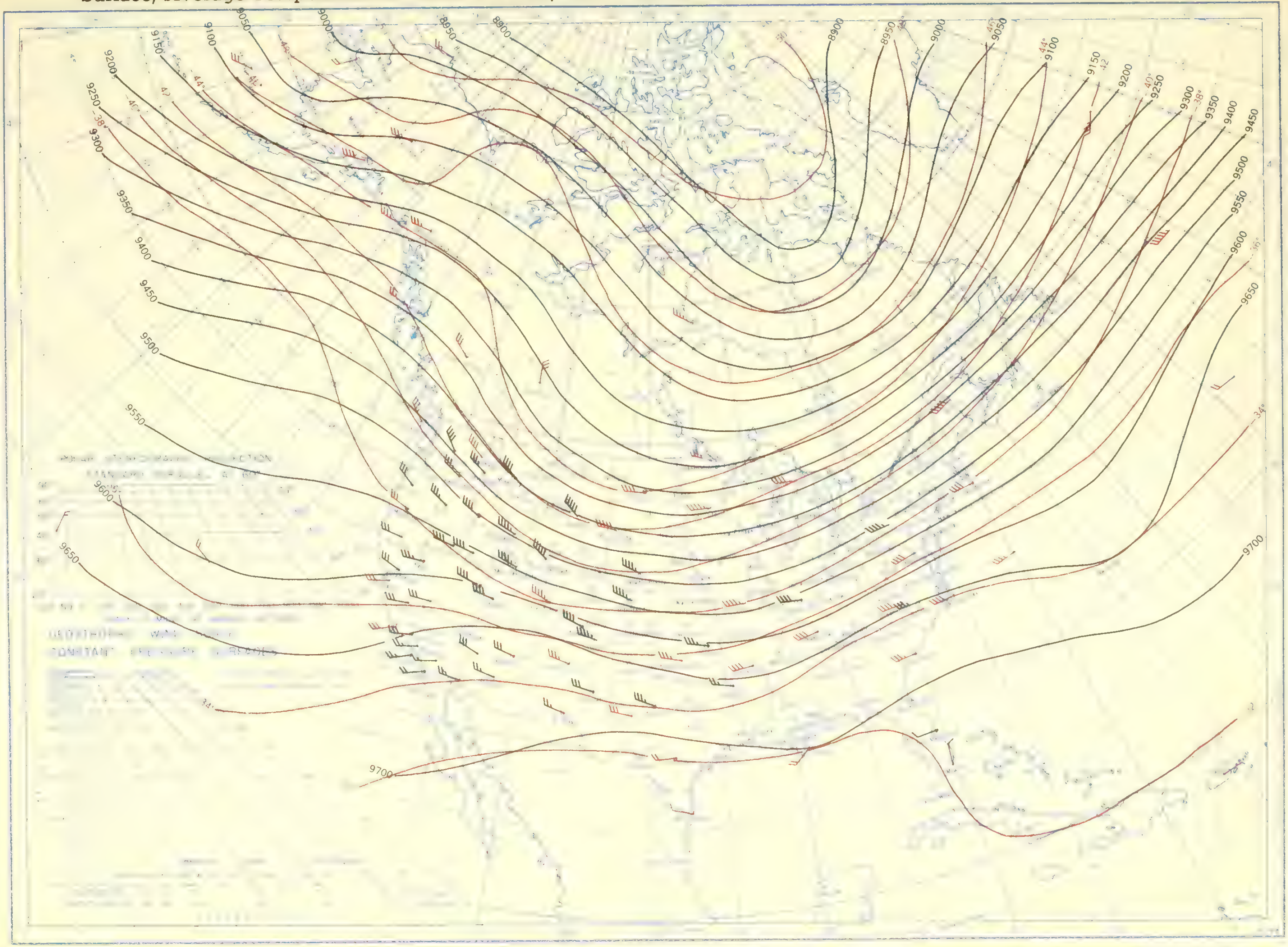
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), September 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), September 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

OCTOBER 1951
Volume 2 No. 10

NEW ORLEANS: 1952

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions---------------------- 307

Condensed Climatological Data - States---------------------- 309

Climatological Data - Stations------------------------------ 310

Heating Degree Days-- 315

Severe Storms-- 316

General Summary of River and Flood Conditions------------- 319

Flood Stage Data--- 319

UPPER AIR DATA

Radiosonde Data-- 320

Pilot Balloon Data--- 323

Rawin Data--- 324

SOLAR RADIATION DATA

Solar Radiation Intensities-------------------------------- 325

Blue Hill Data--- 326

Daily Totals and Average Daily Totals by Weeks------------ 327

CHARTS I-XV

NOTE.—This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 10

OCTOBER 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

The Nation-wide temperature average of 55.4° for October 1951 was 0.1° below the long-term mean. Temperatures averaged below normal in the northwestern quarter of the country except along the coast, and above elsewhere. Monthly departures from normal were generally small. The greatest minus departures exceeded 3° at a number of stations in the northern Rockies, while the greatest plus departures exceeded 4° in a few scattered eastern sections, at a few stations in western Texas, and along the Southwestern Border. Monthly station averages ranged from about 80° in extreme southern Florida to the low 30's in the northern Rocky Mountains. The lowest average reported was 31.6° at the northeast entrance to the Yellowstone National Park.

Extreme temperatures ranged from 110° at Palm Springs, Calif., on the 11th to -8° at Babb, Mont., on the 31st. East of the Continental Divide highest temperatures occurred during the first week in the upper Mississippi Valley and in the central Great Plains on the 1st, and east of the Mississippi River generally on the 5th or 6th. In the South, the Ohio Valley, and southern Lake Region maximum temperatures reached or exceeded late-season records at many stations. A few of these were 87° at Buffalo, N. Y., and Grand Rapids, Mich., on the 4th; 92° at St. Louis, Mo., on the 4th and at Memphis, Tenn. on the 5th; and 96° at Jacksonville, Fla., on the 6th. In addition, several stations, particularly in Texas, reported their highest temperatures of record for October. Among the new October records in Texas were: Fort Worth, 106° and Abilene, 100°, both on the 3d; and Del Rio 102° on the 2d. West of the Continental Divide highest temperatures generally occurred during the last 3 days of the first decade. The lowest temperatures of the month west of the Mississippi River were recorded in northern sections on the 31st and in southern sections on the 22d, 23d, or 24th, with a few scattered stations in the Rocky Mountain States reporting early-season record minima. East of the Mississippi River lowest temperatures generally occurred during the first few days of the second decade.

The Nation-wide precipitation average of 2.22 inches was 0.13 inch below the long-term mean. Monthly totals ranged from none at one or more stations in each of the States of California, Nevada, Utah, New Mexico, Texas, Louisiana, and Mississippi up to 25.01 inches at Valsetz, Oreg. The departure pattern was extremely variable. The far Northwest, sections in the Mississippi Valley, parts of the Lake Region, and southern Florida received much above normal amounts; while the most pronounced deficiencies occurred in parts of North Dakota, central Gulf coastal sections, and on the eastern slopes of the southern Appalachians. In Oregon and Idaho this was one of the wettest Octobers on record; at many stations monthly totals were twice the normals and measurable precipitation occurred on 15 or more days. Precipitation was particularly heavy in eastern Oklahoma and western Arkansas. At Tulsa, Okla. the monthly total was more than double the normal. The monthly total of 12.05 inches at Fort Smith, Ark., was more than three times the normal, and set a new October record for the station. Monthly totals in a strip across southern Florida that included Fort Myers equaled or exceeded 10 inches and ranged up to 17.52 inches. The month's greatest 24-hour precipitation occurred in this area, exceeding 10 inches at a number of stations. In the central Gulf area monthly totals were generally less than 25 percent of normal. At Pensacola, Fla., a monthly total of 0.25 inch was only 6 percent of normal and it all fell on the 22d, 23d, and 24th. At Baton Rouge, La., a monthly total of 0.38 inch, all falling on the 23d and 31st, was only 12 percent of normal. Some other stations that were unusually dry were Huron, S. Dak., with 19 percent of normal; Parkersburg, W. Va., 5 percent; and Charlotte, N. Car., 14 percent of normal.

Snowfall was above normal in nearly all northern areas and fell farther south than usual in some areas. Snow fell as far south as Kansas about the middle of the month and as far south as northern Texas near the end. During the last decade heavy snow fell in the Cascades and Sierras, and northern Rockies, and in the northeastern mountains. The first general snowfall in the Northeast on the 28th was earlier than usual. In Montana the heaviest falls occurred on the 29th and 30th; the greatest monthly total was 61 inches at Summit, and the greatest depth on the ground was 37 inches at the same station on the 29th; and the average for the State was 8.1 inches, or more than twice the normal. In Minnesota the state-wide average of 4.5 inches was the greatest since 1891, and exceeded the previous record by 0.1 inch set in 1917; the greatest monthly total in this State was 18.9 inches, and the greatest depth was 12 inches at Sandy Lake Dam on the 30th and 31st. An unusually heavy, early-season snowstorm in this State on the 30th, accompanied by high winds, delayed traffic, blocked roads, and forced some schools to close. Also on the 30th, similar conditions prevailed in northwestern Wisconsin, with a 14-inch fall at Salon Springs. Roads were blocked locally in Upper Michigan on the 31st.

Sunshine was above normal in the Southwest, the central Gulf area, the Ohio Valley, and southern portion of the Lake Region, but was slightly below normal along the Atlantic Coast, in the Great Plains the northern Rockies, and the Pacific Northwest.

Barometric pressure was below normal in the extreme Southeast, the Southwest, and Northwest, but above in most other sections.

Most of the month's storm damage occurred in southern Florida during the passage of a tropical disturbance. The storm, attended by heavy rains that ranged from about 8 to 13 inches, crossed Florida on the 2d, the center passing from near Fort Myers to Vero Beach. Squall winds of 50 to 60 m.p.h. occurred along the lower east coast and in the Keys. The greatest damage resulted from the heavy rains which flooded early fall crops in the Okeechobee area. Also, a number of cattle were lost by drowning. Losses due to this storm were estimated at about $2,000,000.

On the 2d a tornado occurred near Battleground, Wash., a section where tornadoes seldom occur, and caused about $10,000 damage. Some fruit trees appeared to have been pulled straight up from the ground. Another tornado near Steve, Ark., on the 23d injured 4 persons, but apparently struck in only one spot.

Hail caused $250,000 damage to cotton and sorghums in Reed, Granite, and Greer Counties, Oklahoma, on the 5th and $200,000 property damage in the town of Oakland, Nebr., on the 2d. Rain in the Tucson, Ariz., area on the 29th and 30th lowered the quality of cotton by about $200,000.

During October there was only scattered minor flooding in the Mississippi and Columbia River Basins. Some streams along the Atlantic slope were at record low stages and most streams in the South remained low.

October weather was generally favorable for small grains and cotton, but unfavorable for corn, particularly in the northwestern portion of the Main Belt. Warm, dry weather in the East, South, and far West was favorable for the harvesting of most miscellaneous crops.

In the Pacific States the weather was very satisfactory for harvesting after the first week, and in Washington and Oregon rains during the last week of September and during the first week of October provided ample moisture for seeding, germination, and growth of small grains.

In the Mountain States livestock remained in good condition, especially in the northern sections where ranges were in good to excellent conditions due to abundant moisture. Rain and snow hampered the late grain harvest in north-central Montana and there was some loss, but winter grains where seeded were in good condition. In many sections of the southern Rocky Mountain Region small grains needed moisture, but weather conditions favored field work.

From Texas eastward through the Gulf Plains and thence northward through the Appalachians to Pennsylvania and along the Atlantic Coast to Maryland, the month was dry, and unfavorable for fall-sown grains and pastures, but favorable for harvesting fall crops.

In New Mexico, southeastern Colorado, southwestern Kansas, western Oklahoma, and western Texas fall-sown grains needed rain, but elsewhere in the central and lower Great Plains small grains were generally in good condition. In Nebraska weather conditions were excellent for winter wheat; temperatures were high enough to induce good root growth but not high enough to stimulate excessive top growth.

In the North Central States west of the Great Lakes damp weather prevented corn from drying. The moisture content of corn in Nebraska, eastern Kansas, the Dakotas, Iowa, Wisconsin, and Minnesota was too high for safe cribbing, and less than 10 percent of the total Iowa crop was harvested at the end of the month. Soybean harvest was also hampered in these States by the damp weather. Pastures and livestock in the North Central States were good.

In New York, New England, and the lower Ohio Valley rains at intervals furnished enough moisture for grains and pastures, but there was enough dry, sunny weather for harvesting operations to progress satisfactorily.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 OCTOBER 1951

Section	Temperature								Precipitation					
			Monthly extremes								Monthly extremes			
	Average	Departure from normal	Station	Highest	Date	Station	Lowest	Date	Average	Departure from normal	Station	Greatest	Station	Least
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	66.8	+1.9	7 Stations	95	*5	Alexander City 6NE	30	12	1.85	-0.71	Guntersville City W.Wks.	5.53	Cuba	0.02
Arizona	61.7	-.1	Yuma WB AP	107	10	Alpine	9	23	1.34	+.53	Mt. Lemmon	4.92	Gila Bend CAA	.16
Arkansas	63.1	+.2	Newport	98	7	2 Stations	30	20	4.55	+1.32	Fort Smith WB AP	12.05	Arkansas City	.43
California	60.5	-.7	Palm Springs	110	11	Boca	10	22	1.81	+.72	Elk Valley	12.68	5 Stations	.00
Colorado	46.2	-1.3	2 Stations	92	1	Fraser	-9	22	1.34	+.11	Ferndale Ranch	3.10	Seibert 14S	.09
Connecticut	53.9	+1.8	Norwalk	85	5	Colchester	22	30	4.14	+.62	Wolcott Reservoir	6.07	Norwich	3.13
Delaware	59.8	+2.2	Wilmington WB New Cst	91	5	Georgetown	32	26	2.83	-.28	Dover	3.89	Milford	1.86
Florida	75.3	+2.3	Mt. Pleasant	98	6	2 Stations	38	*11	4.73	+.52	Naples	17.52	2 Stations	.08
Georgia	67.9	+2.5	Hawkinsville	98	6	Tallapoosa 2NNW	26	12	1.96	-.77	Tray Mountain	6.41	Camilla	.28
Idaho	44.7	-2.7	Boise WB AP	87	10	2 Stations	3	31	2.73	+1.31	Clark Fork 1ENE	10.12	Challis	.31
Illinois	57.4	+1.5	5 Stations	92	*4	Marengo	24	11	3.13	+.46	Galena	7.44	Mount Carmel	.97
Indiana	57.3	+2.1	Markland Dam	94	6	Salamonie	23	29	2.74	-.03	Howe	6.89	Bloomington	.76
Iowa	52.0	-.5	5 Stations	91	1	Inwood 2W	14	27	3.28	+.99	Bellevue Lock & Dam	7.45	Riverton	1.21
Kansas	55.9	-1.8	3 Stations	96	*1	3 Stations	19	31	1.97	-.06	Elgin	5.75	Brewster	.20
Kentucky	59.4	+.9	Shelbyville 2W	96	5	Grayson	25	9	2.00	-.63	Anchorage	4.31	Greensburg Hiway 61Br.	.36
Louisiana	69.7	+1.6	Alexandria CAA AP	98	6	Tallulah	31	*9	.86	-2.34	Gueydan	3.75	2 Stations	.00
Maine	47.7	-.2	Dead River 6N	82	6	Gardiner	15	21	3.70	+.14	Belfast	5.30	Eustis	1.40
Maryland	59.2	+2.8	Keedysville	97	5	Oakland	22	26	1.96	-1.04	Ridgely	3.72	Western Port	.41
Massachusetts	53.1	+1.3	Hoosac Tunnel	86	6	Birch Hill Dam	19	21	4.27	+.90	Plainfield	6.74	Provincetown 2WNW	1.80
Michigan	50.1	+1.3	Wayne	92	4	2 Stations	17	*27	4.31	+1.66	Houghton Lake	8.38	Eagle Harbor	1.01
Minnesota	45.2	-.8	Tracy Power Plant	92	1	Park Rapids	-2	31	2.25	+.41	Caledonia	4.97	Argyle	.31
Mississippi	67.0	+1.4	Pontotoc	96	5	6 Stations	31	*9	1.26	-1.28	Holly Springs	3.53	Oakley Exp. Sta.	.00
Missouri	58.4	+.7	4 Stations	92	*4	3 Stations	26	*20	3.77	+.83	Ellington	8.12	Tarkio	1.40
Montana	41.4	-3.9	Rock Springs	86	7	Babb 6NE	-8	31	1.62	+.61	Heron 2SW	7.92	Rock Springs	.19
Nebraska	50.5	-1.5	2 Stations	97	1	Arthur	15	31	1.67	+.20	Chambers	4.98	Rushville	.47
Nevada	50.0	-1.9	Indian Springs	98	10	Fish Creek Ranch	2	22	.83	+.18	Imlay	3.10	2 Stations	.00
New Hampshire	49.1	+1.5	Keene	84	5	Fabyan	15	30	3.75	+.62	South Lyndeboro	6.19	York Pond	2.00
New Jersey	57.3	+2.4	Belvidere	89	5	2 Stations	24	*13	4.42	+.92	Somerville	6.05	Deepwater	2.41
New Mexico	56.0	+1.2	Jal	99	5	Gavilan	3	23	.89	-.24	White Signal	3.20	Mountainair	.00
New York	51.7	+1.5	Elmira	93	6	Angelica	15	13	2.44	-.81	Edgewood	6.87	Scio	.66
North Carolina	63.2	+2.9	3 Stations	99	*5	Celo	20	11	1.91	-1.37	Coweeta No. 8	7.44	Gastonia	.28
North Dakota	42.1	-1.9	Marmarth	87	2	Amenia	2	31	1.04	.00	Pretty Rock	2.88	Adams	.10
Ohio	56.7	+2.8	Gallipolis 5W	95	*3	New Lexington 1N	20	29	1.89	-.61	Toledo	4.96	Marietta Water Works	.53
Oklahoma	63.0	-.1	Waurika	104	3	Guymon WB Airway	26	31	3.62	+.66	Spavinaw	9.42	Goodwell	.25
Oregon	48.4	-1.9	Danner	93	9	2 Stations	8	*17	4.49	+2.27	Valsetz	25.01	OO Ranch	.36
Pennsylvania	54.8	+2.0	Shippensburg	94	5	Kane 1NNE	18	13	2.22	-.98	Wernersville	5.47	Laurenceville 1S	.73
Rhode Island	54.6	+1.2	3 Stations	78	*2	Kingston	26	14	3.29	-.12	Greenville	4.01	Kingston	2.60
South Carolina	66.5	+2.3	Bamberg	99	5	2 Stations	35	*11	1.26	-1.62	Long Creek 2N	3.93	Myrtle Beach CAA AP	.16
South Dakota	46.4	-2.5	Pickstown	95	1	Ralph	0	31	2.10	+.89	Hayes	4.81	Buffalo Gap	.12
Tennessee	61.4	+1.5	4 Stations	95	5	Waynesboro	26	10	2.83	±.00	Walkers Ford	5.00	Colesville	.77
Texas	69.3	+2.5	Possum Kingdom Dam	106	3	2 Stations	27	*23	1.35	-1.10	Kaufman	7.02	6 Stations	.00
Utah	48.8	-.6	Zion NP	93	*8	Silver Lake Brighton	8	22	1.47	+.26	Silver Lake Brighton	4.57	Callao	.00
Vermont	48.8	+1.7	3 Stations	85	*5	West Burke	16	*30	3.11	-.11	Somerset	7.03	Barre	1.50
Virginia	60.1	+2.5	Halifax	99	6	2 Stations	22	*10	1.60	-1.35	Wallaceton LkDrummond	4.01	2 Stations	.22
Washington	48.3	-1.8	Colfax 1NW	88	11	Bumping Lake	12	31	4.93	+2.15	Peterson Ranch	23.26	Quincy 4S	.63
West Virginia	56.9	+2.0	2 Stations	95	5	Cranberry Glades	19	12	1.33	-1.46	Centralia	2.58	Kayford	.06
Wisconsin	48.1	+.3	Brodhead	87	1	Couderay 3N	3	31	3.95	+1.57	Sheboygan	7.61	River Falls	1.01
Wyoming	42.6	-1.7	Torrington Exp. Farm	88	1	Pole Mountain	-7	31	1.56	+.43	Snake River	5.24	2 Stations	T
Hawaii**	74.9	.0	Puunene AP	95	23	Haleakala RS	38	1	3.47	-1.71	Kukui	40.00	8 Stations	.00
Puerto Rico	77.8	+.3	Coloso (2)	96	*6	Garzas	51	22	7.74	+.09	Maricao	22.28	Mona Is.	1.25

* Other dates also.
** September 1951.

CLIMATOLOGICAL DATA

Table 2 OCTOBER 1951

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days		Average dew point		Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy			
												Max. 90° F. or above	Min. 32° F. or below						.01 inch or more	With thunderstorms	Total	Max. depth on ground			Speed	Direction	Date						
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
ALABAMA																																	
Birmingham	610	993.9	1019.3	77	53	65.0	+2.6	91	6	37	11	3	0	56	77	2.78	+0.36	1.19	6	1	0.0	0	7.8	NE	42	NW	31	15	5	11	4.7	67	86
Mobile CO	10	—	—	81	62	71.4	+2.1	90	6	45	9	2	0	—	—	.61	-2.99	.39	2	1	.0	0	10.0	—	26	SE	31	13	13	5	4.2	70	31
Mobile	211	1009.8	1017.9	82	60	71.0	—	92	5	42	11	3	0	59	74	1.19	—	1.12	3	2	.0	0	9.7	NE	—	—	—	14	11	6	4.0	—	31
Montgomery CO	201	—	—	79	59	69.0	+2.4	92	6	42	9	3	0	—	—	1.17	-1.29	.47	3	1	.0	0	—	—	—	—	—	—	—	—	—	—	31
Montgomery	198	1011.2	1018.6	81	56	68.4	+1.8	92	6	41	12	3	0	58	75	1.29	-1.17	.73	3	0	.0	0	6.2	NE	21	SW	31	14	9	8	4.2	72	35
ARIZONA																																	
Flagstaff	6993	788.4	1018.4	62	31	46.6	-.3	75	10	16	23	0	17	28	55	2.26	—	.89	5	3	T	0	7.7	SW	—	—	—	20	7	4	3.0	—	563
Payson CO	5000	848.6	1015.5	73	43	58.3	—	84	9	32	27	0	2	39	51	1.71	—	.86	5	2	T	0	4.7	S	—	—	—	21	5	5	2.9	—	210
Phoenix CO	1083	—	—	88	59	73.3	+2.7	100	10	46	27	15	0	—	—	.80	+.33	.69	3	1	.0	0	5.9	—	20	S	25	—	—	—	—	93	8
Phoenix	1108	973.2	1012.1	88	56	71.9	—	99	9	43	27	15	0	46	46	.52	+.05	.31	3	2	.0	0	4.2	SE	—	—	—	20	8	3	2.6	—	11
Prescott	5014	849.0	1015.4	72	40	55.9	—	85	9	27	23	0	5	30	42	1.70	—	.97	4	3	.0	0	8.8	SW	29	SW	25	21	6	4	3.0	81	281
Tucson	2558	924.8	1011.9	86	59	72.5	+3.8	97	8	43	27	14	0	40	36	1.91	+1.37	1.86	3	2	.0	0	7.6	SE	32	E	7	15	12	4	3.7	85	18
Winslow	4880	852.7	1014.2	73	42	57.1	+1.6	85	11	28	27	0	4	28	38	.69	+.17	.60	4	1	.0	0	6.8	SW	*41	NNW	1	21	7	3	2.7	—	249
Yuma	203	1006.1	1011.2	93	62	77.2	—	107	10	48	26	24	0	39	31	.27	—	.27	1	1	.0	0	6.7	N	29	NW	25	22	8	1	2.2	94	3
ARKANSAS																																	
Fort Smith	458	1001.4	1018.0	76	52	63.9	+1.1	92	4	40	31	2	0	53	80	12.05	+9.06	5.90	7	4	.0	0	7.2	NE	24	SW	22	18	5	8	4.0	61	115
Little Rock	257	1005.8	1018.6	76	52	63.7	+.1	91	5	39	31	3	0	54	80	3.73	+1.02	1.60	5	2	.0	0	6.2	SSE	28	W	6	13	10	8	4.5	66	120
Texarkana	361	1004.7	1018.1	78	55	66.4	-.4	89	4	42	31	0	0	56	80	3.48	+.03	1.53	5	3	.0	0	7.4	SSE	—	—	—	14	7	10	4.6	80	73
CALIFORNIA																																	
Bakersfield	489	997.6	1015.8	80	50	65.1	-.2	97	8	43	26	3	0	40	44	.17	-.20	.17	1	0	.0	0	3.9	NW	—	—	—	26	4	1	1.2	—	52
Beaumont CO	2589	924.8	1014.7	77	49	62.9	—	94	9	38	26	2	0	35	44	.94	—	.93	2	0	.0	0	9.0	E	*28	E	°5	25	4	2	1.9	—	114
Bishop	4108	874.0	1014.6	76	37	56.5	—	87	10	27	22	0	8	—	—	.24	—	.22	2	0	.0	0	—	—	—	—	—	21	5	5	2.6	—	261
Blue Canyon	5280	840.2	1016.0	59	42	50.8	—	74	9	29	25	0	2	31	52	9.17	—	4.63	5	0	1.1	1	10.2	ENE	—	—	—	16	5	10	4.1	—	433
Burbank	699	988.2	1014.1	80	53	66.6	—	97	7	43	26	5	0	46	56	1.15	—	1.15	2	1	.0	0	4.4	S	*17	S	25	24	6	1	2.1	—	44
Eureka CO	43	1016.6	1019.0	61	49	55.0	+1.4	71	10	41	26	0	0	—	—	3.88	+1.55	1.61	13	0	.0	0	5.9	—	25	N	25	7	10	14	6.1	44	303
Fresno	331	1004.1	1016.0	80	47	63.1	+.8	98	8	37	22	3	0	44	56	.33	-.24	.33	1	0	.0	0	5.7	NW	21	NW	20	22	7	2	2.1	96	89
Los Angeles CO	312	—	—	80	58	68.8	+3.5	96	7	50	26	4	0	—	—	.59	-.09	.59	2	1	.0	0	5.7	—	19	S	24	22	5	4	2.5	85	14
Los Angeles	99	1010.5	1014.3	75	57	65.8	—	96	7	49	26	2	0	53	70	.23	—	.23	2	0	.0	0	4.3	WSW	—	—	—	22	8	1	2.6	—	26
Mt. Shasta CO	3543	894.3	1018.3	63	37	49.6	-1.6	81	9	28	17	0	5	36	63	1.79	-.48	.75	6	0	.0	0	8.0	NW	—	—	—	16	6	9	4.6	—	471
Oakland	3	1016.6	1017.0	72	50	61.1	+2.4	87	7	43	28	0	0	49	69	.54	-.39	.42	4	0	.0	0	5.3	W	—	—	—	17	8	6	3.7	—	123
Red Bluff	341	1003.4	1016.2	76	51	63.7	-.6	92	7	44	31	3	0	41	50	1.98	+.65	1.26	5	1	.0	0	7.4	NW	35	SE	23	17	7	7	3.8	80	78
Sacramento CO	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	82
Sacramento	17	1014.9	1015.9	76	48	62.2	-.7	90	8	42	22	1	0	47	62	1.33	+.41	1.27	4	0	.0	0	8.4	NNW	41	SE	24	20	7	4	3.0	80	100
Sandberg CO	4517	863.2	1014.8	66	47	56.4	—	84	9	34	25	0	0	30	44	.57	—	.57	2	0	.0	0	20.6	NW	—	—	—	26	5	0	1.4	—	276
San Diego	19	1010.8	1014.0	75	59	66.8	+2.7	91	7	52	24	2	0	54	70	.68	+.14	.63	4	0	.0	0	5.3	N	22	SE	25	17	10	4	3.7	69	17
San Francisco CO	52	—	—	69	54	61.5	+1.0	86	7	46	29	0	0	—	—	.81	-.31	.51	6	0	.0	0	7.8	—	36	S	24	18	5	8	3.7	77	123
San Francisco	1	1016.3	1016.8	70	50	60.1	+2.4	89	7	42	27	0	0	51	76	.64	-.12	.56	4	0	.0	0	10.4	WNW	41	SSW	24	16	10	5	3.7	—	153
Santa Catalina	1568	958.0	1013.5	73	58	65.2	—	87	7	48	25	0	0	—	—	.73	—	.72	2	0	.0	0	—	—	—	—	—	21	7	3	2.7	—	87
Santa Maria	231	1007.1	1015.7	78	48	62.6	—	94	6	40	15	3	0	46	63	.61	—	.61	2	0	.0	0	7.6	W	*25	NNE	12	26	3	2	1.5	—	110
COLORADO																																	
Alamosa	7534	772.8	1019.2	62	24	42.8	—	73	11	10	23	0	24	—	—	.35	—	.26	4	0	.0	0	—	—	—	—	—	20	6	5	3.1	—	680
Colorado Springs	6175	811.4	1018.1	61	35	47.7	—	79	1	23	31	0	12	26	51	1.52	—	1.06	4	3	3.3	1	9.8	SSE	—	—	—	15	7	9	4.4	—	528
Denver	5292	838.8	1016.8	61	35	48.2	-1.3	80	12	21	31	0	11	29	53	2.16	+1.06	1.70	6	1	8.1	2	6.9	S	27	NW	5	9	12	10	5.4	64	513
Grand Junction	4849	861.2	1015.9	64	40	52.4	-.4	77	11	31	23	0	4	31	50	1.27	+.32	.61	7	3	T	T	7.9	ESE	38	NW	12	12	12	7	4.3	71	383
Pueblo	4799	857.4	1016.9	66	34	49.9	-1.3	84	1	22	22	0	12	29	54	1.02	+.36	.54	3	0	3.1	2	6.3	WNW	33	W	2	13	8	10	4.7	59	462
CONNECTICUT																																	
Bridgeport	7	1020.0	1020.7	65	48	56.2	—	80	6	36	13	0	0	48	74	3.18	—	1.58	8	1	.0	0	9.1	NE	*38	ESE	7	9	7	15	6.2	—	274
Hartford	15	1014.9	1020.5	65	44	54.3	+3.1	79	5	30	13	0	4	46	78	4.13	+.61	2.41	8	1	.0	0	6.7	NNE	28	NW	7	4	11	16	6.9	43	331
New Haven	6	1015.9	1019.6	55	46	55.2	+3.4	79	6	33	14	0	0	—	—	3.99	+.64	1.87	9	1	.0	0	7.4	—	42	SE	7	9	6	16	6.4	51	308
DELAWARE																																	
Wilmington	73	1016.9	1020.2	69	50	59.1	—	91	5	39	14	1	0	50	74	3.17	—	1.37	7	2	.0	0	7.5	NE	—	—	—	10	8	13	6.2	—	214
FLORIDA																																	
Apalachicola	13	1015.2	1016.6	80	66	72.8	+2.2	88	7	52	12	0	0	—	—	1.87	-1.32	1.60	4	2	.0	0	8.8	—	25	NE	21	18	8	5	3.2	79	4
Daytona Beach	33	1014.2	1015.7	83	68	75.2	+2.7	94	6	53	11	4	0	69	84	8.54	+2.79	2.18	14	3	.0	0	9.3	NE	*24	NNE	2	12	10	9	5.1	—	2
Fort Myers	15	1014.2	1014.6	86	69	77.2	+1.3	90	°9	60	11	6	0	69	80	11.91	+7.43	10.85	8	4	.0	0	7.4	E	—	—	—	13	12	6	4.5	—	0
Jacksonville CO	18	—	—	81	66	73.5	+2.4	95	6	51	11	4	0	—	—	6.02	+1.56	4.25	10	0	.0	0	—	—	—	—	—	—	—	—	—	—	8
Jacksonville	52	1015.9	—	82	65	73.4	+3.3	96	6	48	11	4	0	65	80	5.53	+1.07	4.03	9	2	.0	0	7.7	NNE	42	NE	2	10	5	16	6.2	56	7
Key West CO	5	1013.2	1013.9	86	75	80.3	+1.2	91	3	70	29	3	0	—	—	3.82	-2.18	1.66	6	6	.0	0	7.9	—	31	S	2	11	13	7	5.4	66	0
Key West	6	1013.5	1013.5	84	75	79.5	+.2	89	4	70	17	0	0	72	78	4.02	-1.98	1.50	10	5	.0	0	11.1	NE	—	—	—	14	8	9	5.0	—	0
Lakeland CO	214	—	—	84	68	76.0	+1.0	92	7	55	11	5	0	—	—	.81	-1.81	.35	10	1	.0	0	—	—	—	—	—	11	17	3	4.7	—	1
Melbourne	22	1014.2	1015.1	84	69	76.5	+1.9	91	5	59	11	3	0	69	82	5.52	-1.31	2.59	15	3	.0	0	9.4	NE	*25	NE	13	10	12	9	5.1	—	0
Miami CO	180	—	—	83	73	77.9	-.1	87	°4	65	11	0	0	—	—	8.01	+.27	3.95	14	4	.0	0	10.7	—	55	S	2	11	10	10	5.5	58	0
Miami	9	1013.2	1014.0	85	71	78.1	—	90	6	65	19	2	0	70	79	6.54	—	3.51	14	4	.0	0	7.3	N	*30	S	2	10	11	10	5.4	—	0
Miami Beach	3	—	—	83	75	78.7	—	88	°3	66	11	0	0	—	—	6.58	—	3.05	15	0	.0	0	—	—	—	—	—	13	9	9	—	—	0
Orlando	111	1011.5	1015.6	85	67	76.1	+2.0	94	6	55	11	5	0	68	81	3.08	-1.53	1.98	11	1	.0	0	9.1	NNE	*25	NE	13	10	12	9	5.2	—	0
Pensacola CO	13	1008.1	—	81	64	72.5	+2.6	91	7	47	9	1	0	—	—	.25	-3.95	.24	3	1	.0	0	7.5	—	18	NE	15	16	10	5	3.6	88	14
Pensacola	110	—	1017.4	—	—	—	—	—	—	—	—	—	—	62	—	—	—	—	—	—	—	—	7.3	ENE	—	—	—	—	—	—	—	—	—
Tallahassee	64	1014.9	1017.3	83	63	72.7	—	93	6	46	11	4	0	61	73	.62	—	.62	2	0	.0	0	5.6	NE	—	—	—	16	9	6	4.1	—	8
Tampa	24	1014.2	1015.5	85	67	76.4	+2.1	93	7	57	12	5	0	67	79	.84	-2.25	.63	5	0	.0	0	6.3	NE	19	NE	13	13	8	10	4.9	77	0
West Palm Beach	14	1013.2	1013.9	86	72	78.8	—	91	4	64	11	3	0	71	81	12.62	+2.00	7.48	8	4	.0	0	7.6	NE	—	—	—	9	12	10	5.5	—	0
GEORGIA																																	
Albany	190	1011.2	1018.2	82	59	70.7	+1.7	95	5	42	11	4	0	58	71	.60	-1.77	.33	6	0	.0	0	4.5	NE	—	—	—	14	8	9	4.1	—	19
Atlanta CO	1054	—	—	74	55	64.7	+1.7	91	5	43	°9	1	0	—	—	2.59	.00	.73	8	0	.0	0	—	—	—	—	—	—	—	—	—	—	83
Atlanta	977	970.9	1018.9	75	55	65.1	+2.4	91	6	43	11	1	0	54	73	2.78	+.09	.92	9	0	.0	0	8.3	ENE	24	NW	7	18	3	10	4.2	75	73
Athens	798	990.2	—	76	54	64.6	—	93	6	41	12	2	0	—	—	1.37	—	.67	8	0	.0	0	—	—	—	—	—	16	5	10	4.2	—	77
Augusta	426	1011.9	1018.2	79	56	67.5	+1.6	94	5	41	12	4	0	58	78	1.67	-.96	.55	7	0	.0	0	5.9	NE	*22	W	28	10	8	13	5.5	—	37
Columbus	382	1004.4	1018.4	79	56	67.8	—	93	6	41	12	3	0	57	75	1.24	—	1.03	4	0	.0	0	7.6	NE	—	—	—	10	4	9	3.9	—	39
Macon	354	1004.4	1017.9	81	56	68.5	—	96	6	40	12	4	0	57	72	.61	—	.21	7	1	.0	0	9.1	NE	28	S	31	17	6	8	3.9	76	32
Rome	637	995.9	1019.5	77	51	64.0	—	93	6	34	12	3	0	54	80	3.67	—	1.63	8	0	.0	0	6.7	N	—	—	—	15	7	9	4.3	—	94
Savannah	38	1015.2	1017.4	79	61	70.1	+4.4	94	7	46	12	4	0	61	80	3.47	+.49	2.21	7	0	.0	0	8.2	NNE	24	N	3	8	5	18	6.4	41	20
Valdosta	200	1009.1	1017.1	82	61	71.8	+2.5	96	6	42	12	4	0	60	—	1.25	-.86	.93	4	1	.0	0	8.6	NE	—	—	—	14	9	8	4.6	—	16
IDAHO																																	
Boise	2842	921.4	1018.2	60	39	49.2	-.9	87	10	23	31	0	5	37	67	1.60	+.36	.38	12	5	T	T	7.0	SE	38	SW	°10	7	12	12	6.0	59	482
Lewiston	1413	965.5	1018.0	60	40	49.5	—	81	10	21	31	0	7	42	77	2.10	—	.56	14	2	.0	0	3.8	E	—	—	—	4	11	16	7.2	—	475
Pocatello	4444	863.9	1017.9	58	34	45.8	-.7	81	10	21	16	0	13	32	62	.81	-.87	.29	7	0	2.3	1	8.7	SW	42	W	10	9	7	15	6.2	49	586
ILLINOIS																																	
Cairo CO	314	1005.8	1018.6	72	53	62.2	+1.7	88	4	36	31	0	0	—	—	1.94	-.82	.75	8	1	.0	0	7.1	—	26	N	19	13	8	10	5.3	77	155
Chicago	618	995.6	1018.4	65	45	54.9	+2.4	90	4	31	29	1	2	45	76	2.73	+.17	1.35	8	1	T	0	8.9	S	37	W	30	8	13	10	6.0	57	342
Joliet	580	996.6	1018.3	65	43	54.1	+2.5	88	4	27	29	0	3	46	83	3.27	+.45	1.48	10	1	.0	0	11.0	S	—	—	—	8	12	11	6.0	—	367
Moline	589	996.3	1018.8	65	45	54.6	+2.6	86	1	29	31	0	1	46	79	3.75	+1.36	1.10	12	4	T	0	10.5	S	47	SW	14	9	7	15	6.3	50	350
Peoria	659	996.6	1018.6	65	45	55.2	+1.7	88	4	30	31	0	1	46	80	2.97	+.68	1.43	11	3	.0	0	10.6	S	33	N	23	10	8	13	5.5	53	334
Springfield CO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	260
Springfield	598	994.9	1018.3	67	47	57.0	+3.4	89	4	33	31	0	0	48	78	2.89	+.36	1.54	6	1	T	0	11.6	S	30	S	21	11	7	13	5.5	58	291

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
INDIANA																																	
Evansville	385	1003.7	1019.4	72	46	59.2	+2.2	91	5	33	20	2	0	49	83	2.02	-0.80	1.04	7	1	T	T	7.5	S	29	N	31	13	9	9	4.8	66	226
Fort Wayne	801	987.1	1018.4	67	44	55.4	+2.7	90	4	30	29	1	4	45	81	3.44	+.84	1.81	6	1	T	T	8.3	SW	28	S	22	12	9	10	5.2	63	335
Indianapolis CO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	226
Indianapolis	796	989.8	1019.3	69	45	57.0	+2.9	90	4	32	29	1	1	47	78	3.28	+.50	2.50	6	1	T	T	10.5	SSE	38	W	24	15	8	8	4.7	66	281
South Bend	768	990.5	1018.5	64	43	53.9	+.6	87	4	30	29	0	3	46	82	4.75	+1.68	2.65	8	1	T	T	11.0	S	*30	W	30	7	11	13	6.1	—	366
Terre Haute	585	998.3	1019.5	69	45	57.2	+1.0	87	4	32	29	0	2	47	79	3.06	+.33	2.04	6	1	T	0	7.2	S	26	SW	3	18	5	8	4.2	69	274
IOWA																																	
Burlington	605	992.6	1018.3	65	45	55.1	+1.3	88	4	30	31	0	3	46	81	4.12	+1.43	1.22	13	6	.0	0	1.1	SSW	30	NW	30	9	8	14	6.2	54	333
Charles City CO	1013	983.1	1020.3	60	41	50.5	+1.9	83	1	22	31	0	5	—	—	2.31	-.02	.95	12	3	T	T	6.7	—	24	W	30	10	6	15	5.8	48	460
Davenport CO	579	996.3	—	64	46	55.3	+1.6	85	1	29	31	0	1	—	—	3.60	+1.21	1.15	13	6	T	T	—	—	—	—	—	—	—	—	—	—	327
Des Moines	800	986.5	1018.2	62	43	52.6	-.8	86	2	25	31	0	4	44	77	2.64	+.14	1.02	12	4	T	T	11.4	S	45	NW	30	9	8	14	5.9	48	403
Dubuque	641	978.3	1017.9	60	41	50.6	—	83	1	26	31	0	7	43	83	7.44	—	1.50	15	8	.0	0	11.9	SSW	*34	SW	14	8	7	16	6.5	—	459
Sioux City	1097	975.6	1017.4	62	39	50.6	+.9	90	1	25	31	1	10	41	77	1.95	+.18	1.18	7	4	.2	T	9.2	N	40	NW	30	11	7	13	5.6	57	457
KANSAS																																	
Concordia CO	1375	967.2	1017.3	64	45	54.6	-1.3	87	2	30	31	0	1	—	—	1.24	-.73	.39	3	4	T	T	7.7	—	23	S	12	15	2	14	5.2	52	345
Dodge City	2594	928.5	1016.2	67	42	54.3	-1.8	90	2	25	31	1	3	42	73	1.33	+.03	.48	9	4	1.5	2	15.0	S	32	N	30	14	6	11	4.6	60	350
Goodland	3645	889.3	1016.7	65	34	49.6	-4.4	89	1	19	31	0	13	34	66	.58	-.42	.26	7	2	T	T	11.0	NW	*32	NW	13	15	6	10	4.8	—	476
Topeka CO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	308
Topeka	926	981.7	1017.8	66	46	56.2	—	88	2	30	31	0	1	47	78	3.07	—	1.94	11	6	T	T	10.1	S	37	S	21	15	2	14	5.4	58	315
Wichita	1372	968.2	1016.9	67	47	56.8	-1.8	92	3	30	31	1	1	47	77	2.05	-.54	.62	9	4	.6	1	13.9	S	41	S	20	13	5	13	5.1	56	293
KENTUCKY																																	
Lexington	979	984.1	1020.0	71	47	59.1	+1.7	89	5	35	29	0	0	48	71	3.10	+.51	1.02	6	3	T	T	7.7	SSE	—	—	—	13	9	9	4.5	—	229
Louisville CO	—	—	—	72	51	61.0	+1.7	89	5	38	31	0	0	—	—	2.38	-.27	1.33	5	—	.0	0	—	—	—	—	—	—	—	—	—	—	184
Louisville	485	1003.1	1019.3	73	46	59.4	+1.9	90	5	33	9	2	0	49	74	3.27	+.62	2.31	5	2	.0	0	6.0	SE	29	W	7	11	10	10	5.1	64	224
LOUISIANA																																	
Baton Rouge	64	1012.9	1017.7	83	59	70.8	+1.7	91	2	41	11	4	0	59	78	.38	-3.07	.30	2	0	.0	0	4.8	NE	—	—	—	16	8	7	3.9	—	32
Lake Charles	12	1016.3	1017.5	82	60	71.4	+1.7	90	2	47	11	2	0	61	84	.65	-3.49	.45	2	2	.0	0	7.7	NE	—	—	—	16	7	8	4.2	—	17
New Orleans CO	12	1015.6	—	81	66	73.7	+2.7	91	4	55	9	2	0	—	—	.75	-2.55	.70	3	2	.0	0	6.4	—	21	N	9	16	11	4	3.7	82	7
New Orleans	12	1015.6	1017.6	82	63	72.6	—	91	3	48	12	2	0	62	80	1.11	—	.54	3	2	.0	0	8.4	NE	*26	N	8	15	10	6	3.7	—	11
Shreveport	174	1008.8	1017.9	80	56	68.1	+1.0	92	4	44	9	5	0	58	80	1.64	-1.05	.62	5	2	.0	0	7.3	SE	29	NW	31	16	6	9	4.3	75	39
MAINE																																	
Caribou	624	996.6	1020.1	53	35	44.0	+2.5	68	17	24	30	0	14	37	79	2.95	-.61	1.41	10	0	.6	1	10.1	S	*32	WNW	25	10	5	16	6.4	—	644
Eastport	33	1017.3	1020.0	56	43	49.1	+1.6	66	5	32	30	0	1	—	—	2.55	-1.00	.99	9	0	T	T	9.4	—	38	S	25	10	8	13	5.5	56	485
Portland	61	1016.3	1020.3	59	39	49.0	+.3	69	5	24	30	0	10	44	84	4.01	+.87	1.80	12	0	.0	0	7.8	N	33	S	25	10	5	16	6.2	44	491
MARYLAND																																	
Baltimore CO	14	—	—	70	54	61.9	+3.7	92	5	44	13	1	0	—	—	2.29	-.60	1.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	148
Baltimore	146	1013.5	1020.7	70	50	59.9	—	92	5	40	9	1	0	50	72	2.02	—	.82	5	1	.0	0	10.1	NE	40	NW	8	11	8	12	5.9	46	196
Frederick	294	—	—	72	47	59.3	—	92	5	32	26	2	0	—	—	1.38	—	.47	7	1	.0	0	—	—	—	—	—	—	—	—	—	—	216
MASSACHUSETTS																																	
Boston	12	1015.9	1020.3	62	48	54.8	+1.2	72	16	37	13	0	0	45	74	3.98	+.83	1.30	13	0	.0	0	11.5	WNW	34	S	25	10	5	16	6.2	47	309
Nantucket	43	1019.3	1019.6	63	49	55.5	+1.3	75	3	33	14	0	0	51	83	5.06	+1.63	2.61	9	0	.0	0	11.1	ENE	33	NE	11	7	8	16	6.7	39	291
Pittsfield	1153	977.3	1020.0	60	39	49.5	+2.7	81	5	25	13	0	8	—	—	4.78	+1.70	2.33	7	0	T	0	8.1	—	—	—	—	5	11	15	6.6	—	477
MICHIGAN																																	
Alpena CO	587	995.6	1018.3	55	42	48.2	+1.1	76	3	30	31	0	3	—	—	4.37	+1.66	1.57	15	6	T	—	10.7	—	42	W	31	6	4	21	7.5	37	513
Detroit	619	991.9	1018.6	66	45	55.4	+3.5	89	4	29	29	0	1	44	76	4.96	+2.58	2.61	8	2	T	0	9.1	S	40	WSW	31	13	7	11	5.1	59	332
Escanaba CO	594	995.3	1018.3	52	40	45.7	-.3	72	3	24	31	0	8	—	—	3.19	+.56	1.35	12	4	.3	T	12.8	—	43	NW	30	6	8	17	7.1	34	586
Grand Rapids CO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	371
Grand Rapids	638	992.9	1018.3	63	42	52.5	+4.1	87	4	25	29	0	6	44	82	3.21	+.40	1.50	9	1	.0	0	9.0	SSW	47	W	30	5	9	17	7.3	48	409
Lansing	859	986.5	1018.7	62	43	52.5	+2.2	86	4	27	29	0	5	43	80	4.17	+1.70	1.98	8	1	.0	—	11.3	SSE	40	W	31	10	9	12	5.7	56	408
Marquette CO	677	990.2	1018.0	53	39	45.6	-1.1	76	3	22	31	0	7	—	—	3.70	+.94	1.37	15	2	6.8	3	9.2	—	47	NW	31	2	4	25	8.5	31	597
Muskegon	627	994.9	1018.1	60	43	51.1	-.2	83	4	29	29	0	4	45	83	18	+1.48	1.49	10	5	T	0	9.4	SSW	*42	W	31	6	5	20	7.3	—	439
Sault Ste. Marie	721	995.3	1018.0	52	37	44.9	+1.9	72	16	26	29	0	9	39	86	.39	+1.30	1.59	15	8	3.0	T	9.7	NW	47	W	31	5	3	23	7.9	29	615
Ypsilanti	722	990.2	1018.5	66	44	55.0	—	91	4	30	29	1	3	43	78	4.03	—	2.09	6	2	.0	0	9.8	SSW	*35	W	31	12	6	13	5.4	—	342
MINNESOTA																																	
Duluth CO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	707
Duluth	1128	975.3	1017.8	49	35	42.0	—	76	1	12	31	0	12	36	85	2.57	—	.73	14	3	5.8	5	11.8	ENE	43	E	2	4	5	22	7.9	29	706
Intern'l. Falls	1179	974.3	1018.7	49	32	40.3	-1.4	78	1	10	31	0	17	35	85	2.21	+.32	.85	14	—	5.4	2	—	—	—	—	—	1	6	24	8.5	—	757
Minneapolis	830	984.1	1017.9	57	40	48.9	.0	83	2	18	31	0	7	40	77	1.44	-.64	.48	8	2	.8	T	11.3	NW	42	NW	30	10	5	16	6.3	44	506
Rochester	1014	980.0	1017.8	58	39	48.6	.0	83	1	19	31	0	8	41	83	2.73	+.77	1.12	9	6	T	T	10.3	NW	—	—	—	8	7	16	6.5	—	505
St. Cloud	1034	978.7	1017.4	55	35	45.2	-2.2	85	1	10	31	0	11	38	84	3.14	+1.16	.97	10	3	3.2	3	8.0	WNW	—	—	—	8	4	19	7.1	—	609
St. Paul	703	990.5	1017.2	58	40	48.8	+.2	84	1	18	31	0	7	41	78	1.46	-.74	.50	8	2	.1	T	8.6	SSE	*32	NNW	30	9	5	17	6.6	—	505
MISSISSIPPI																																	
Jackson	315	1006.8	1018.5	83	55	68.7	+2.8	93	3	38	9	6	0	56	68	.33	-2.26	.25	2	1	.0	0	6.7	NNW	20	NW	31	18	5	8	3.7	71	57
Meridian	294	1004.7	1018.5	81	53	67.2	+4.5	93	5	35	11	4	0	56	75	.61	-1.78	.55	3	0	.0	0	4.8	NW	—	—	—	19	4	8	4.0	—	67
Vicksburg	234	1010.5	—	79	58	68.5	+1.8	88	5	44	10	0	0	—	—	.96	-1.81	.52	5	2	.0	0	8.2	—	25	N	31	14	7	10	4.5	70	51
MISSOURI																																	
Columbia	733	989.5	1018.0	68	49	58.1	+1.7	90	4	33	31	1	0	48	78	3.36	+.75	1.62	9	3	.1	T	10.0	SSE	32	NW	30	10	9	12	5.7	56	256
Kansas City	741	983.4	1017.8	66	49	57.6	-.1	88	1	32	31	0	1	48	75	3.99	+1.30	1.97	11	4	.1	T	8.5	S	56	W	21	9	7	15	6.1	44	279
St. Joseph	809	982.4	1017.5	66	46	55.8	-.2	88	1	31	31	0	1	46	78	2.74	-.15	1.31	9	6	.0	0	10.1	SSE	31	S	21	11	6	14	5.5	53	328
St. Louis CO	—	998.3	—	69	51	60.0	+1.2	91	4	35	31	1	0	—	—	2.73	+.01	1.68	7	3	T	T	11.4	—	30	S	3	11	9	11	5.4	65	211
St. Louis	465	998.3	1018.7	69	49	59.3	+2.0	92	4	34	31	1	0	49	78	2.48	-.94	1.44	6	2	T	0	7.4	SSE	—	—	—	12	8	11	5.4	—	234
Springfield	1265	970.2	1018.0	68	48	58.0	+.4	90	4	30	31	1	1	50	84	4.70	+1.65	1.78	7	5	.6	T	12.4	SSE	49	S	21	12	6	13	5.5	48	254
MONTANA																																	
Billings	3568	892.0	1017.2	55	35	44.7	-3.3	81	9	15	31	0	16	32	66	.86	-.29	.23	12	0	8.7	2	8.6	SW	40	NW	15	5	8	18	6.9	49	620
Butte	5530	829.7	1019.7	50	26	37.9	-3.6	75	10	4	30	0	22	28	72	.96	+.17	.32	12	0	7.2	4	7.4	NW	—	—	—	6	3	22	7.5	—	831
Glasgow CO	2090	941.8	1018.0	54	31	42.8	-1.8	82	9	7	31	0	18	33	72	.85	+.07	.33	9	0	8.3	4	—	—	—	—	—	5	5	21	7.5	—	682
Great Falls	3664	888.9	1017.3	51	33	42.0	-5.2	79	9	7	31	0	15	32	71	1.72	+.86	.34	13	2	10.9	5	12.4	SW	52	SW	28	4	3	24	7.9	36	709
Havre CO	2488	927.9	1018.6	51	31	41.3	-3.2	81	9	10	31	0	16	—	—	1.00	+.33	.53	8	0	7.7	5	7.5	—	31	W	20	5	6	20	7.5	41	727
Helena	3893	874.4	1018.7	52	31	41.2	-2.6	79	9	14	31	0	17	32	73	.79	+.18	.16	14	3	5.6	2	5.8	W	36	S	23	4	3	24	7.7	41	730
Kalispell	2965	912.6	1017.4	49	34	41.0	—	67	8	17	31	0	16	34	81	2.96	—	.44	20	2	9.9	6	7.0	S	—	—	—	1	3	27	9.2	—	734
Miles City	2629	932.6	1018.2	55	33	44.0	—	82	9	10	31	0	17	35	—	.70	—	.19	11	1	4.2	2	8.2	SSE	—	—	—	6	8	17	6.9	—	643
Missoula	3201	903.2	1018.9	53	34	43.4	+.1	74	9	22	26	0	14	36	77	1.31	+.36	.28	12	0	2.0	2	4.3	ESE	36	N	29	2	6	23	8.4	26	663
NEBRASKA																																	
Grand Island	1841	949.9	1016.6	62	39	50.7	—	92	1	21	31	1	7	41	76	1.54	—	.62	8	5	T	0	12.2	S	—	—	—	14	5	12	4.9	—	455
Lincoln CO	—	—	—	63	44	53.6	-.6	87	1	28	31	0	2	—	—	1.92	+.04	.86	8	5	.0	0	9.0	—	35	SE	3	—	—	—	—	51	372
Lincoln	1180	973.9	1017.5	63	41	52.2	-.8	87	1	27	31	0	5	43	—	2.17	+.29	.92	10	6	T	T	9.5	SSE	—	—	—	11	7	13	5.5	—	410
Norfolk	1554	995.3	1017.6	61	39	50.1	-1.6	93	1	25	31	1	11	40	77	1.39	-.15	.64	7	4	T	0	12.2	NNW	—	—	—	12	6	13	5.2	—	471
North Platte	2783	917.0	1016.5	62	35	48.2	-1.5	90	1	20	22	1	14	37	75	1.02	-.05	.41	6	1	2.0	1	9.1	SE	43	N	30	12	11	8	5.1	59	520
Omaha	978	977.7	1017.8	63	43	53.2	-.2	87	1	26	31	0	5	43	76	1.02	-1.15	.34	10	4	.0	—	11.0	SSE	36	SE	75	10	8	13	5.5	52	387
Scottsbluff	3950	880.1	1017.1	61	35	47.9	-1.8	85	1	22	31	0	14	33	68	1.01	+.06	.59	9	2	2.3	1	8.1	NW	—	—	—	9	10	12	5.7	—	525
Valentine CO	2581	924.8	1017.3	59	36	47.4	-1.9	89	1	24	31	0	12	—	—	1.38	+.28	.53	6	2	1.0	1	7.7	—	31	W	30	6	11	14	6.5	54	544

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile								
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy			
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
NEVADA																																	
Elko	5075	845.9	1018.2	62	26	44.1	—	80	9	13	27	0	24	27	54	0.38	—	0.28	5	2	0.0	0	6.5	W	—	—	—	9	11	11	5.1	—	645
Ely	6257	810.0	1018.0	61	25	43.0	+1.2	77	9	10	22	0	24	—	—	.32	-.45	.12	6	0	T	0	11.5	—	43	S	10	14	9	8	4.0	71	672
Las Vegas	2162	937.7	1012.9	79	51	64.9	+1.2	95	10	41	22	3	0	26	28	.05	-.23	.05	1	0	.0	0	6.3	W	—	—	—	24	2	5	2.3	85	86
Reno	4397	863.5	1017.6	65	28	46.8	-1.7	84	9	20	22	0	26	29	55	.96	+.60	.86	3	0	T	0	4.4	W	50	S	23	17	6	8	3.6	76	558
Winnemucca	4299	869.3	1018.3	63	29	45.7	-2.6	83	9	16	17	0	22	29	55	2.19	+1.57	1.63	7	0	T	T	8.1	—	38	W	10	12	10	9	4.8	75	593
NEW HAMPSHIRE																																	
Concord	339	1009.8	1020.6	62	39	50.0	+2.2	80	5	24	30	0	9	42	77	3.44	+.59	1.14	10	0	.0	0	4.8	NW	28	NW	12	10	5	16	6.4	41	465
Mt. Washington	6262	808.7	1024.0	41	27	33.9	+4.2	58	5	6	29	0	20	—	—	2.73	-3.54	1.34	12	0	3.9	4	25.6	W	••95	NW	26	6	9	16	6.5	43	951
NEW JERSEY																																	
Atlantic City CO	8	1017.6	1019.6	66	55	60.7	+3.8	88	6	45	9	0	0	—	—	2.69	-.51	.96	11	2	.0	0	16.8	—	49	N	4	6	10	15	6.5	53	157
Newark	11	1019.3	1020.4	66	50	57.9	+2.3	85	5	40	9	0	0	48	73	4.21	+.42	1.87	6	1	.0	-0	9.8	NE	•33	NNW	7	9	6	16	6.3	—	239
Trenton CO	56	1012.9	1019.6	67	50	58.2	+2.6	84	5	39	14	0	0	—	—	4.43	+1.65	2.20	8	2	T	T	8.6	—	60	NW	7	9	10	12	6.2	56	232
NEW MEXICO																																	
Albuquerque	5310	850.0	1014.4	72	45	58.8	+2.2	83	1	31	24	0	1	28	36	.37	-.44	.24	5	3	.0	0	7.8	N	49	NW	1	19	8	4	3.2	81	200
Clayton	4969	846.3	1015.6	69	37	53.3	-1.4	86	2	25	31	0	7	38	52	.33	-.99	.18	5	4	T	0	—	—	—	—	—	19	7	5	3.3	—	364
Raton	6379	806.0	1015.4	67	33	49.6	—	80	11	22	24	0	17	24	45	.44	—	.40	2	3	.2	T	8.3	NE	—	—	—	15	12	4	3.7	—	473
Roswell	3611	894.0	1014.4	79	47	62.9	+3.4	93	1	32	24	5	1	36	44	.29	-1.13	.13	4	3	.0	0	8.8	SSE	36	NW	31	10	8	5	3.3	77	112
NEW YORK																																	
Albany	277	1016.6	1020.2	62	41	51.5	+2.2	84	5	26	21	0	6	44	78	4.48	+2.06	1.88	7	1	.0	0	7.5	SSE	37	W	6	6	13	12	6.3	59	418
Bear Mountain	1300	—	—	59	45	52.2	—	76	5	34	29	0	0	—	—	5.13	—	2.46	6	1	.0	0	—	—	—	—	—	8	8	15	6.5	—	394
Binghamton	1601	960.7	1020.4	61	42	51.1	—	85	5	30	13	0	2	42	75	1.32	—	.63	6	0	T	T	13.0	S	47	NE	7	8	6	17	6.6	42	434
Buffalo	693	991.5	1019.9	64	45	54.6	+3.5	87	4	32	28	0	1	44	72	1.87	-1.42	1.09	8	0	T	0	11.5	S	49	SW	7	9	7	15	5.6	51	348
New York CO	10	1008.5	—	65	52	58.7	+2.4	81	5	42	29	0	0	—	—	4.85	+1.32	2.41	5	1	.0	0	11.9	—	49	W	°7	9	7	15	5.9	57	212
New York	19	1018.6	1020.4	66	53	59.3	—	84	5	44	29	0	0	45	69	4.42	—	2.47	8	1	.0	0	13.4	NE	49	N	°6	7	8	16	6.4	—	191
Oswego	292	1006.8	1019.3	62	45	53.9	+3.6	85	5	33	28	0	0	—	—	1.78	-1.50	.98	10	2	T	T	9.5	—	29	W	29	13	3	15	5.7	50	355
Rochester	543	1000.0	1019.5	66	42	53.9	+2.4	91	5	29	28	2	4	44	76	1.78	-.87	1.15	6	0	T	0	9.1	SSW	35	SW	25	9	7	15	6.0	50	365
Syracuse	399	998.0	1020.1	64	43	53.1	+3.6	86	3	30	13	0	3	44	78	1.86	-1.27	.93	10	1	T	T	9.4	E	32	NW	29	12	4	15	5.7	48	377
NORTH CAROLINA																																	
Asheville CO	2203	—	—	72	47	59.6	+4.3	88	6	35	12	0	0	—	—	1.09	-1.66	.43	10	1	.0	0	—	—	26	NW	7	16	7	8	4.3	70	195
Asheville	2093	946.5	1020.1	—	—	—	—	—	—	—	—	—	—	49	81	—	—	—	—	—	—	-	4.5	NNW	—	—	—	—	—	—	—	—	—
Charlotte	753	991.5	1017.7	75	54	64.5	+4.6	93	6	39	12	4	0	53	70	.44	-2.51	.25	4	0	.0	0	6.3	NE	23	S	7	14	6	11	4.9	79	91
Greensboro	891	989.2	1020.3	75	50	62.5	+4.0	94	5	37	26	3	0	51	73	.68	-2.37	.46	8	0	.0	0	8.8	NE	27	NE	10	12	8	11	5.2	67	134
Hatteras	4	1016.3	1017.0	73	64	68.7	+2.8	85	6	56	°11	0	0	64	87	5.98	+1.03	1.64	14	2	.0	0	13.8	NNE	38	NE	3	10	7	14	5.9	54	16
Raleigh CO	400	—	—	75	55	64.8	+2.8	97	6	43	°10	3	0	—	—	1.82	-1.04	1.05	6	2	.0	0	—	—	18	N	3	8	7	16	6.4	40	86
Raleigh	438	1003.7	1019.3	75	52	63.6	—	96	5	36	26	3	0	53	75	2.90	—	1.72	5	1	.0	0	7.4	NNE	—	—	—	9	6	16	5.9	—	110
Wilmington	30	1016.6	1017.9	77	60	68.1	+2.8	93	6	45	12	2	0	61	—	2.11	-1.16	1.32	8	0	.0	0	10.5	NNE	34	N	3	6	9	16	6.4	61	43
Winston-Salem	967	984.8	1020.0	74	52	63.2	+4.6	96	5	40	10	4	0	49	65	1.40	-1.76	.44	5	0	.0	0	10.5	NE	—	—	—	15	8	8	4.5	—	131
NORTH DAKOTA																																	
Bismarck	1653	958.0	1018.2	54	32	42.9	-1.7	83	1	11	31	0	16	35	79	.41	-.53	.21	5	—	2.0	2	9.1	E	34	NW	16	4	8	19	7.2	45	680
Devils Lake CO	1471	938.8	1018.6	49	31	39.9	-2.5	77	1	11	31	0	17	—	—	.21	-1.04	.09	4	1	.7	T	8.9	—	29	W	16	9	3	19	6.8	44	768
Fargo	895	982.4	1017.5	53	34	43.4	-1.1	84	1	5	31	0	14	36	78	1.69	.00	.65	8	—	8.1	7	12.8	SSE	36	NW	15	6	6	19	7.3	44	665
Williston CO	1877	949.9	1018.2	52	33	42.3	-1.1	79	9	9	31	0	16	34	78	.69	-.17	.36	8	—	3.6	2	6.8	—	40	W	15	6	1	24	7.7	42	695
OHIO																																	
Akron	1210	982.1	1020.2	66	44	54.8	+2.4	86	4	28	29	0	2	4	73	1.89	-.78	.85	6	2	T	0	8.6	SSE	—	—	—	14	7	10	5.0	—	334
Cincinnati Obs.	761	—	—	71	47	59.2	+3.5	92	5	33	29	3	0	—	—	2.61	+.10	1.94	7	2	T	0	5.2	—	21	SW	24	—	—	—	—	65	237
Cincinnati	553	987.5	1019.5	70	47	58.5	—	89	5	31	9	0	1	46	67	2.56	—	2.02	6	1	T	T	8.1	S	—	—	—	15	6	10	4.6	—	247
Cleveland CO	—	—	—	68	49	58.5	+4.9	88	4	38	9	0	0	—	—	1.49	-1.29	.52	8	—	.0	0	—	—	—	—	—	—	—	—	—	—	250
Cleveland	787	991.5	1019.3	69	47	57.8	+5.1	88	4	34	9	0	0	46	70	1.53	-1.25	.56	7	0	.0	0	10.9	S	42	SW	7	12	8	11	5.2	63	265
Columbus CO	724	—	—	69	48	58.7	+3.5	89	5	34	9	0	0	—	—	1.98	-.48	1.18	4	—	T	0	—	—	—	—	—	—	—	—	—	—	248
Columbus	815	990.2	1020.3	69	44	56.8	+3.3	90	5	28	29	1	2	46	71	1.36	-1.41	.55	6	1	T	0	6.6	SE	30	W	7	14	8	9	4.5	68	297
Dayton	1002	983.1	1019.7	69	46	57.2	+3.4	89	4	31	29	0	1	45	69	1.79	-.79	1.21	7	1	T	T	9.6	SE	38	W	7	11	11	9	4.9	71	280
Sandusky CO	603	996.3	—	68	49	58.5	+4.2	92	4	34	29	2	0	—	—	2.29	-.15	.71	5	0	.0	0	7.9	—	29	SW	7	14	8	9	4.7	71	255
Toledo	621	995.9	1019.3	67	44	55.8	+4.2	92	4	30	29	1	3	45	74	3.83	+1.46	2.15	6	2	.0	0	10.9	SSW	36	SW	24	13	9	9	5.0	59	325
Youngstown	1178	977.0	1019.7	66	44	54.9	+3.0	87	5	32	13	0	3	44	72	2.00	-.52	1.08	5	2	.0	0	8.8	SE	•37	WSW	7	15	5	11	4.9	—	329
OKLAHOMA																																	
Oklahoma City CO	1254	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	-	—	—	—	—	—	—	—	—	—	—	171
Oklahoma City	1254	970.2	1016.8	74	50	62.0	+.5	96	3	32	31	3	1	50	73	1.42	-1.44	.48	8	4	.0	0	16.0	SSE	65	S	21	13	9	9	4.8	65	172
Tulsa	672	992.6	1017.0	73	51	61.7	+.1	90	4	34	31	3	0	52	80	8.72	+5.37	3.95	11	7	T	0	11.6	SSE	31	NW	6	14	4	13	4.9	63	172
OREGON																																	
Baker	3369	—	—	—	—	—	—	—	—	—	—	—	—	33	—	—	—	—	—	—	—	-	6.4	SE	—	—	—	—	—	—	—	—	—
Baker CO	3446	896.7	1019.1	57	34	45.5	-1.1	79	9	18	31	0	12	—	—	.96	+.05	.30	12	0	1.0	1	5.8	—	25	SW	10	6	10	15	6.3	57	597
Burns CO	4140	874.4	1018.5	58	32	44.9	-1.1	81	9	23	30	0	16	33	68	1.71	+1.09	.50	13	2	T	0	—	—	—	—	—	9	9	13	5.7	—	618
Eugene	364	1004.7	1018.5	63	43	53.0	—	82	8	30	31	0	1	47	83	5.73	—	1.34	14	0	.0	0	6.7	S	—	—	—	2	11	18	7.6	—	363
Meacham	4050	877.4	1019.0	51	35	43.2	—	76	9	18	31	0	13	35	77	6.49	—	1.70	15	0	9.6	4	6.1	ESE	—	—	—	4	6	21	7.8	—	669
Medford	1314	970.9	1018.9	65	40	52.4	-1.2	85	7	30	31	0	4	43	76	3.48	+2.07	1.09	10	0	.0	0	3.6	S	•32	SSW	10	4	12	15	6.7	—	383
Pendleton	1489	963.8	1017.7	60	42	51.0	-.7	76	9	22	31	0	3	42	73	2.59	+1.47	.66	14	1	.0	0	8.7	SE	—	—	—	10	8	13	5.5	—	426
Portland CO	30	—	—	62	49	55.8	+1.6	81	8	38	30	0	0	—	—	6.90	+3.78	2.15	14	0	.0	0	—	—	—	—	—	—	—	—	—	—	290
Portland	21	1011.5	1017.3	62	46	53.7	+1.0	79	7	31	30	0	1	47	81	6.81	—	2.06	17	0	.0	0	5.3	S	34	SW	19	4	5	22	7.8	35	343
Roseburg CO	479	1000.3	1019.3	63	46	54.6	+.7	85	8	37	31	0	0	—	—	5.39	+2.78	1.87	16	0	.0	0	3.4	—	22	SW	19	2	9	20	8.1	31	316
Salem	195	1010.2	1017.8	63	44	53.1	-1.1	80	7	31	30	0	2	47	81	7.29	+4.38	2.07	17	0	T	0	7.5	S	—	—	—	5	8	18	7.4	—	362
Sexton Summit CO	3836	—	—	55	42	48.2	—	75	9	33	20	0	0	—	—	6.18	—	1.44	15	1	T	0	—	—	—	—	—	8	7	16	6.5	—	515
Troutdale	29	—	—	62	45	53.5	—	77	9	31	30	0	2	—	—	7.51	—	2.11	18	2	.0	0	—	—	—	—	—	6	7	18	7.3	—	358
PENNSYLVANIA																																	
Allentown	381	1006.8	1021.1	65	45	55.1	+2.1	90	5	31	13	1	2	47	77	4.31	+1.01	2.36	7	1	T	0	6.8	NE	—	—	—	6	13	12	6.4	—	322
Curwensville	2215	—	—	62	41	51.1	—	83	5	29	29	0	5	42	77	1.39	—	.50	6	1	T	T	10.0	ESE	•25	ESE	7	11	7	13	5.7	—	431
Erie CO	655	—	—	66	49	57.3	+3.9	89	4	38	13	0	0	—	—	2.25	-1.44	.79	11	0	.0	0	8.6	—	29	SE	7	11	7	13	5.5	46	272
Harrisburg	335	1006.8	1020.5	66	48	56.9	+2.1	89	5	34	13	0	0	47	72	1.40	-1.53	.61	5	1	.0	0	6.2	ESE	25	W	28	7	13	11	5.9	56	274
Park Place	1932	—	—	60	44	52.1	—	82	5	31	13	0	2	—	—	3.80	—	1.89	6	1	.0	0	—	—	—	—	—	7	12	12	6.2	—	402
Philadelphia CO	26	—	—	69	53	60.7	+2.9	90	5	42	13	1	0	—	—	4.39	+1.58	2.17	6	2	.0	0	7.6	—	24	NE	4	9	10	12	6.1	58	170
Philadelphia	13	1015.9	1018.8	69	51	60.2	+4.7	89	5	40	14	0	0	50	72	3.33	+.52	1.60	7	2	.0	0	9.3	ENE	28	NNW	7	8	9	14	6.5	—	184
Pittsburgh CO	749	—	—	70	48	59.2	+4.3	91	3	38	10	1	0	—	—	1.07	-1.45	.36	7	—	T	0	—	—	—	—	—	—	—	—	—	45	221
Pittsburgh	1248	989.8	1020.3	68	48	57.9	+3.8	89	3	34	29	0	0	44	64	1.45	-1.07	.68	7	1	T	0	9.0	SSE	32	SW	7	14	4	13	5.3	55	254
Reading CO	266	1008.5	1020.3	68	50	58.7	+3.3	93	5	36	14	1	0	—	—	3.05	-.07	1.49	6	1	.0	0	9.2	—	49	E	7	7	10	14	6.5	51	228
Scranton CO	746	991.5	1020.7	64	45	54.6	+2.7	88	5	31	13	0	1	—	—	3.81	+.78	2.10	6	1	.0	0	5.5	—	21	NE	7	8	11	12	6.1	41	335
Williamsport	527	1001.4	1020.4	66	43	54.3	+1.7	91	5	29	14	1	4	45	76	1.77	-1.63	.70	6	1	.0	0	5.9	W	•45	SSE	24	4	11	16	7.1	—	345
RHODE ISLAND																																	
Block Island	110	1015.9	1020.1	62	50	56.4	+1.5	71	2	39	30	0	0	—	—	3.03	-.53	1.15	9	2	.0	0	—	—	—	—	—	8	8	15	6.3	—	264
Providence CO	12	—	—	65	47	55.9	+3.7	81	6	34	14	0	0	—	—	3.52	+.40	1.53	9	—	.0	0	—	—	—	—	—	—	—	—	—	—	277
Providence	55	1014.6	1020.4	64	45	54.4	+3.7	78	6	31	14	0	1	46	77	3.27	+.15	1.18	10	0	.0	0	8.3	NNE	30	SW	25	10	7	14	5.8	56	325

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature										Average dew point	Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days				Total	Departure from normal	Greatest in 24 hours	No. of days		Snow, Sleet, Hail		Average hourly speed	Prevailing direction	Fastest mile			Clear	Partly cloudy	Cloudy			
												Max. 90° F. or above	Min. 32° F. or below						.01 inch or more	With thunderstorms	Total	Max depth on ground			Speed	Direction	Date						
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%	
SOUTH CAROLINA																																	
Charleston CO	9	1015.6	------	76	64	70.2	+2.4	89	5	53	12	0	0	--	--	1.75	-1.52	1.53	2	0	.0	0	11.6	---	38	NE	14	7	8	16	6.5	43	17
Charleston	41	1015.9	1017.6	78	61	69.2	+4.0	92	6	44	12	3	0	60	79	1.11	-2.16	.80	6	0	.0	0	7.7	NNE	--	---	--	6	8	17	6.8	--	30
Columbia CO	332	1005.8	------	78	58	67.9	+3.6	94	5	46	10	3	0	--	--	.57	-1.99	.24	4	0	.0	0	7.9	---	22	SW	31	12	6	13	5.4	53	36
Columbia	217	1010.2	1018.3	80	56	67.7	-----	96	°5	39	°12	4	0	56	73	.67	-----	.22	5	0	.0	0	6.8	NE	--	--	--	12	7	12	5.4	--	47
Florence	146	1012.5	1018.2	78	56	67.2	-----	96	5	44	13	3	0	56	74	.55	-----	.28	3	0	.0	0	8.2	N	--	---	--	7	7	17	6.4	--	55
Greenville	1006	981.7	1018.7	76	55	65.3	+5.1	92	6	45	11	3	0	52	68	1.10	-2.02	.34	8	0	.0	0	9.0	NNE	33	NW	28	16	6	9	4.2	75	75
Spartanburg	801	989.5	1019.4	75	54	64.2	+2.8	92	5	42	12	4	0	53	72	.96	-2.29	.25	8	0	.0	0	7.4	NE	*38	WSW	7	14	7	10	1.4	--	93
SOUTH DAKOTA																																	
Huron	1282	969.5	1017.3	57	35	46.4	-1.3	92	1	16	27	1	12	37	77	1.99	+.71	1.15	9	2	2.9	1	10.2	NW	45	S	13	9	6	16	6.3	54	580
Rapid City	3215	901.8	1017.5	58	35	46.6	-1.0	85	1	14	31	0	13	35	72	.88	-.06	.39	10	2	1.2	1	10.2	NNW	42	NW	15	7	7	17	6.8	48	565
Sioux Falls	1420	965.5	1017.6	59	36	47.6	-2.5	88	1	16	27	0	13	39	78	1.51	-.05	.39	9	3	2.9	2	9.8	N	*31	NW	30	11	5	15	6.0	--	546
TENNESSEE																																	
Bristol	1519	965.8	1020.2	73	46	59.4	+.8	86	°3	31	12	0	1	48	72	1.91	-.71	.82	8	1	.0	0	5.2	NE	--	---	--	19	4	8	3.7	--	202
Chattanooga	670	989.2	1019.6	76	51	63.4	+5.7	93	6	36	12	3	0	53	77	3.64	+.63	2.00	6	1	.0	0	4.8	NE	29	W	31	14	6	11	5.0	53	111
Knoxville	949	984.4	1019.9	74	50	61.9	+3.3	91	6	38	11	1	0	52	76	2.90	+.28	.76	7	2	.0	0	5.0	NE	29	NW	31	13	10	8	4.3	56	140
Memphis	----	------	------	74	56	64.8	+1.5	89	4	38	31	0	0	-		3.88	+1.20	1.59	5	-	.0	0	----	---	--	---	--	-	--	--	----	--	116
Memphis	263	1004.4	1019.1	76	51	63.7	+2.3	92	5	37	9	4	0	53	73	3.02	-.48	1.37	4	1	.0	0	8.5	SE	34	NW	6	15	7	9	4.3	72	134
Nashville	577	999.7	1019.5	75	50	62.0	+1.0	92	°5	36	10	3	0	51	74	4.35	+1.86	2.30	5	1	.0	0	4.0	S	29	NW	7	13	8	10	4.8	58	165
TEXAS																																	
Abilene	1752	955.0	1015.4	81	56	68.5	+4.2	100	3	38	31	6	0	50	61	1.35	-1.15	.96	6	3	.0	0	11.7	S	38	SW	21	17	6	8	4.0	78	77
Amarillo	3590	889.9	1015.0	73	45	59.0	+3.2	93	1	29	31	2	1	40	61	2.37	+.71	1.34	7	4	T	T	12.6	S	40	W	3	16	9	7	3.8	67	231
Austin	515	995.6	1017.0	83	60	71.6	+3.3	95	6	51	31	6	0	60	75	.93	-2.26	.60	6	1	.0	--	8.6	S	29	N	6	16	4	11	4.5	69	14
Big Spring	2533	927.5	1015.6	80	55	67.7	+2.9	98	1	40	31	6	0	48	58	.77	-1.22	.50	6	1	.0	0	14.9	S	--	---	-	16	8	7	4.3	--	73
Brownsville	16	982.1	1014.9	86	68	77.0	+2.1	92	2	60	10	5	0	67	81	5.35	+1.75	3.75	7	2	.0	0	9.3	SE	29	S	31	18	7	6	3.9	68	0
Corpus Christi	40	1015.2	1016.3	85	68	76.3	+5.2	91	6	54	9	6	0	67	82	.90	-1.57	.55	7	1	.0	--	10.3	SE	30	S	31	15	8	8	4.5	62	0
Dallas	487	998.6	1016.8	81	57	69.2	+1.9	99	3	41	31	6	0	55	69	2.89	+.18	1.37	6	3	.0	--	10.2	S	31	S	21	16	8	7	3.9	76	56
Del Rio	957	983.4	1016.3	85	64	74.6	+4.6	102	2	53	10	9	0	57	66	2.09	+.26	1.74	7	4	.0	0	8.3	ESE	26	N	6	12	6	13	5.5	64	0
El Paso	3920	832.2	1012.9	81	55	67.8	+5.8	90	1	45	10	1	0	40	40	.43	-.37	.42	3	1	.0	0	9.6	N	38	W	21	19	9	3	3.0	82	21
Fort Worth	688	993.2	1017.4	82	58	69.8	+4.1	106	3	40	31	6	0	51	67	1.62	-1.19	.65	7	4	.0	0	14.3	S	*30	S	21	17	6	8	3.8	--	52
Galveston CO	----	------	------	79	70	74.5	+1.8	87	4	60	8	0	0	-	--	1.61	-2.75	.74	4	-	.0	0	11.4	---	29	N	7	--	--	--	----	73	0
Galveston	7	1016.6	1017.2	80	70	74.6	+1.9	87	6	58	8	0	0	65	79	1.56	-2.80	.81	4	2	.0	0	----	SSE	--	---	--	18	5	8	4.0	--	0
Houston CO	----	1012.2	------	82	64	73.3	+3.0	90	6	53	8	2	0	--	--	.82	-2.90	.72	3	1	.0	0	9.5	---	25	S	21	13	9	9	4.6	68	1
Houston	41	1014.6	1017.2	82	62	72.4	+3.5	91	3	51	9	3	0	63	82	1.18	-2.03	1.09	3	1	.0	0	12.0	SE	--	---	--	12	9	10	5.0	--	3
Laredo	500	1000.0	1015.0	88	67	77.6	+3.9	100	3	57	10	13	0	64	69	.44	-1.67	.24	4	1	.0	-	12.1	SE	-	---	-	14	6	11	4.9	--	0
Lubbock	3238	904.2	1014.8	76	48	61.8	+.7	92	1	34	7	3	0	44	61	.93	-1.36	.78	5	1	.0	0	11.1	S	*27	W	21	17	6	8	3.6	--	166
Palestine CO	491	999.3	1017.3	79	59	69.0	+1.8	90	3	45	31	1	0	-	--	.80	-2.52	.28	5	1	.0	0	7.1	---	20	NW	31	14	9	8	4.4	70	33
Port Arthur CO	----	1016.3	------	80	65	73.2	+1.6	88	6	53	9	0	0	--	--	.59	-2.78	.41	3	2	.0	0	10.6	- -	28	N	7	16	7	8	4.0	65	1
Port Arthur	5	1016.6	1017.5	81	61	71.0	-----	90	6	48	9	1	0	63	86	.53	-----	.27	3	1	.0	0	8.5	NE		---	--	16	7	8	4.3	-	15
San Angelo	1903	949.2	1015.6	82	57	69.4	+3.4	100	3	42	24	5	0	52	62	.14	-2.13	.09	4	3	.0	0	10.7	SSE	*26	S	20	15	7	9	4.5	--	46
San Antonio	782	991.9	1016.5	84	62	72.9	+2.4	94	6	50	9	6	0	59	70	1.41	-.79	.78	6	3	.0	0	8.4	SE	31	NE	7	12	9	10	4.9	68	2
Victoria	109	1011.9	1016.3	84	64	73.9	+.8	91	6	53	9	5	0	65	82	1.22	-1.32	1.57	5	1	-- -	--	7.4	SSE	*42	W	23	11	10	10	5.2	--	3
Waco	504	998.3	1016.6	82	58	70.3	+2.0	94	3	45	31	7	0	59	73	1.89	-1.70	.33	6	2	.0	0	12.5	S	--	---	--	16	7	8	4.2	--	35
Wichita Falls	1027	979.3	1016.0	80	54	67.3	-.2	101	3	36	31	5	0	50	63	1.43	-1.42	.58	6	3	.0	0	11.7	SE	*25	S	20	16	7	8	3.9	--	94
UTAH																																	
Milford	5029	847.3	1017.3	64	33	48.8	-.4	82	10	20	22	0	16	31	57	1.82	+.93	1.20	5	1	5.0	3	7.0	SSW	--	---	--	18	6	7	3.5	--	496
Salt Lake City CO	4260	------	------	--	--	----	-----	--	--	--	--	--	--	--	--	-----	-----	----	--	-	----	--	----	---	--	--	--	--	--	-	-	--	396
Salt Lake City	4222	867.9	1016.1	62	40	50.5	-.3	79	10	26	31	0	5	36	61	1.90	+.59	1.42	9	3	T	0	6.9	SSE	32	S	10	12	5	11	5.6	57	443
VERMONT																																	
Burlington	398	1005.1	1019.6	60	40	50.1	+.9	79	5	26	28	0	10	42	75	2.25	-.72	1.69	9	0	T	T	9.9	SSW	30	NW	°29	9	4	18	6.2	32	459
VIRGINIA																																	
Cape Henry CO	16	1017.6	1018.3	70	61	65.7	+3.6	89	7	49	30	0	0	--	--	2.05	-.96	.60	8	1	.0	0	16.1	---	50	N	4	13	5	13	5.5	57	17
Lynchburg	947	986.5	1020.3	71	51	60.7	+3.5	93	5	37	26	2	0	49	71	1.66	-1.49	.50	9	1	.0	0	8.5	N	38	W	7	9	9	13	5.7	56	179
Norfolk CO	11	1015.2	1019.0	71	60	65.3	+2.8	89	7	50	12	0	0	--	--	[illegible]	+.59	1.58	9	2	.0	0	10.7	---	38	NE	4	--	---	--	----	18	[illegible]
Norfolk	25	1018.0	1019.0	71	57	63.9	+4.0	89	7	42	12	0	0	57	81	3.23	+.19	1.27	10	2	.0	0	11.6	NE	--	-	-	8	7	16	6.5	--	95
Richmond CO	162	------	------	72	53	62.4	+2.8	94	5	42	26	2	0	--	--	2.05	-.83	1.32	8	-	.0	0	----	---	--	---	--	-	--	--	----	--	138
Richmond	160	1013.5	1019.8	72	51	61.6	+3.4	92	°5	39	26	2	0	53	78	2.71	-----	1.88	8	1	.0	0	7.3	N	23	NE	3	4	11	16	6.7	41	161
Roanoke	1192	978.0	1020.3	72	49	60.3	+2.8	93	5	35	26	2	0	47	68	1.12	-2.70	.37	8	1	.0	0	6.9	SE	-	---	-	13	7	11	5.1	-	192
Washington CO	72	------	------	71	53	61.7	+4.3	94	5	41	26	1	0	--	--	1.66	-1.18	.95	5	1	.0	0	6.9	---	23	NW	28	--	--	--	---	56	152
Washington Nat'l.	14	1016.3	1020.6	71	53	62.1	+4.7	91	5	43	26	1	0	51	69	1.67	-1.17	.82	5	1	.0	0	9.4	NNE	34	NW	7	10	7	14	5.9	46	140
WASHINGTON																																	
Ellensburg	1727	934.6	1017.5	58	36	46.6	-1.6	75	9	18	31	0	9	39	76	.66	+.09	.18	12	1	.0	0	7.6	NW	-	---	--	3	9	19	7.0	--	563
Kelso	17	------	------	61	42	51.6	-----	83	8	27	31	0	4	--	--	6.57	-----	1.44	19	0	.0	0	----	---	--	---	--	4	9	18	7.2	--	410
North Head CO	194	1008.5	1015.9	59	48	53.4	+.5	80	8	39	31	0	0	--	--	8.13	+3.12	1.97	21	2	T	0	11.2	---	55	S	18	6	8	17	6.8	40	354
Olympia	190	1008.8	1016.7	60	41	50.4	-----	82	8	27	31	0	5	46	87	6.95	----	1.32	19	0	.0	0	4.8	S	--	---	--	2	11	18	7.7	--	443
Port Angeles	11	1015.2	1016.5	55	45	50.0	-----	63	10	38	31	0	0	45	83	2.80	- --	.51	17	0	.0	0	9.4	W	--	---	-	4	7	20	7.9	--	452
Seattle	14	1015.8	1016.8	--	--	----	-----	---	--	--	--	-	--	46	80	-----	-----	-----	-		----	--	7.9	SSE	--	---	--	-	--	--	----	--	---
Seattle CO	14	------	------	59	48	53.6	-.1	76	8	38	30	0	0	--	-	4.71	+1.87	.82	22	0	.0	0	8.9	---	42	SW	19	8	4	19	7.4	32	346
Spokane	2357	947.9	1017.5	54	38	45.7	-2.6	75	10	25	31	0	9	39	78	3.26	+2.09	.88	17	2	1.2	1	7.4	SSW	27	SW	14	5	6	20	7.5	28	591
Stampede Pass CO	3960	878.4	1018.6	44	35	39.2	-----	64	10	22	31	0	16	--	-	10.10	--	1.76	22	0	28.1	18	11.6	---	47	SW	°19	7	2	22	7.5	--	791
Stevenson CO	319	------	------	59	47	52.7	-----	74	8	35	30	0	0	--	--	13.60	-----	3.50	17	0	.0	0	----	---	--	---	-	6	5	20	7.4	--	372
Tacoma CO	127	1009.5	1016.6	58	46	51.9	+1.4	82	8	36	30	0	0	--	--	4.65	+1.32	1.18	22	0	.0	0	6.5	--	34	SW	3	5	8	18	7.2	32	401
Tatoosh CO	101	1012.5	1015.6	55	48	51.6	+1.7	62	7	41	22	0	0	47	86	9.49	+1.36	1.74	20	4	T	0	15.7	E	57	S	19	3	7	21	8.0	29	409
Walla Walla	1200	------	------	--	--	----	-----	---	---	--	-	--	-	44	--	----	----	-----	--	--	--	--	7.1	S	--	-	-	-	--	--	----	--	---
Walla Walla CO	949	981.4	1017.3	61	44	52.8	-.7	76	9	29	31	0	2	-	--	2.77	+1.24	.59	13	1	.0	0	5.1	-	24	SW	°14	10	4	17	6.1	47	372
Yakima	1061	977.7	1016.9	62	34	48.2	-3.5	80	9	18	31	0	12	39	71	1.08	+.43	.32	12	0	.0	0	6.8	W	-	---		6	6	19	6.6	--	515
Seattle-Tacoma AP	379	1002.7	1016.8	58	44	50.8	-----	80	8	32	30	0	1	46	84	5.87	-----	.97	22	0	.0	0	10.5	SW	--	---	--	4	7	20	7.5	--	433
WEST VIRGINIA																																	
Charleston	950	985.4	1020.1	73	46	59.7	-----	92	4	33	29	2	0	49	74	1.47	-----	.55	9	1	.0	0	6.3	S	*30	WSW	°7	11	8	12	5.4	--	206
Elkins	1969	951.6	1021.1	69	39	53.8	+2.7	86	3	24	26	0	9	44	77	1.22	-.69	.44	10	3	.0	0	3.9	WNW	30	W	7	12	7	12	5.5	57	341
Huntington	565	------	------	76	47	61.3	+8.0	93	4	33	29	3	0	--	--	1.18	-1.46	.41	6	—	.0	0	----	---	--	---	--	-		--	—	--	174
Parkersburg CO	615	------	------	71	46	58.4	+2.3	90	4	31	29	1	1	--	--	1.20	-1.28	.39	8	2	T	0	4.8	---	22	NW	5	16	5	10	4.9	62	248
Parkersburg	837	------	1018.3	--	--	----	-----	---	--	--	--	--	--	47	--	-----	-----	-----	--	--	----	--	6.6	SSW	--	--	--		--	--	----	--	---
Petersburg	1013	983.7	------	74	42	57.8	-----	95	5	28	26	2	3	--	--	1.15	-----	.88	3	1	.0	0	--	---	--	--	--	13	6	12	5.1	--	241
WISCONSIN																																	
Green Bay	689	995.3	1018.1	57	39	47.6	-.9	77	3	25	31	0	9	41	85	4.82	+2.28	1.15	15	5	T	T	10.7	SW	65	SW	30	6	10	15	6.7	45	533
La Crosse CO	----	------	------	--	--	----	------	---	--	--	--	--	--	--	--	-----	-----	-----	--	--	-----	--	----	---	--	---	--	--	--	--	----	-	427
La Crosse	669	992.6	1017.5	60	42	50.6	+1.5	80	1	22	31	0	4	42	78	3.92	+1.60	1.53	11	8	T	0	10.0	S	*38	SW	30	10	4	17	6.5	--	445
Madison CO	----	------	------	--	--	----	------	---	--	--	--	--	--	--	--	-----	-----	-----	--	--	-----	--	----	---	--	---	--	--	--	--	----	--	454
Madison	857	986.8	1018.6	60	40	50.0	+.7	82	3	26	31	0	7	42	82	5.38	+2.95	1.30	15	5	.7	1	12.0	S	73	SW	30	6	11	14	6.3	52	472
Milwaukee CO	----	------	------	--	--	----	------	---	--	--	--	--	--	--	--	-----	-----	-----	--	--	-----	--	----	---	--	---	--	--	--	--	----	--	411
Milwaukee	674	992.2	1017.9	60	42	51.1	+1.6	81	2	30	31	0	4	44	82	4.42	+2.07	1.06	13	2	.0	0	12.2	SSW	49	W	30	5	14	12	6.3	60	440

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2—Continued

OCTOBER 1951

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	Temperature: No. of days: § Max. 90° F. or above	Temperature: No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: No. of days: .01 inch or more	Precipitation: No. of days: With thunderstorms	Precipitation: Snow, Sleet, Hail: Total	Precipitation: Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Wind: Fastest mile: Speed	Wind: Fastest mile: Direction	Wind: Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine	Heating degree days
	Ft.	*Mb.*	*Mb.*	*°F.*	*°F.*	*°F.*	*°F.*	*°F.*		*°F.*				*°F.*	*%*	*In.*	*In.*	*In.*			*In.*	*In.*	*M. p. h.*		*M. p. h.*			*0–3*	*4–7*	*8–10*	*0–10*	*%*	
WYOMING																																	
Casper	5322	837.1	1015.6	55	34	44.3	-3.8	76	1	13	31	0	14	29	61	0.88	-0.37	0.34	11	1	6.7	2	11.2	SW	--	----	--	8	7	16	6.7	—	635
Cheyenne	6139	811.7	1016.7	56	32	43.8	-1.0	76	9	16	31	0	18	29	62	2.26	+1.30	1.34	8	2	12.2	4	11.9	W	57	NW	20	8	13	10	5.5	62	650
Lander	5563	835.8	1017.3	55	32	43.4	-.1	74	1	14	31	0	17	28	59	1.45	+.09	1.13	5	0	1.6	2	6.7	---	49	SW	15	10	9	12	5.7	50	661
Rock Springs	6741	794.8	1018.3	53	31	42.2	-2.4	71	10	14	31	0	19	27	59	.77	-.28	.29	11	4	1.2	1	12.2	WSW	*32	WNW	°1	8	7	16	6.2	—	704
Sheridan	3942	885.2	1018.1	56	32	44.0	-.6	80	9	14	31	0	17	33	72	1.37	+.30	.36	14	2	9.3	3	7.3	NW	38	NW	15	6	8	17	7.1	51	646
PACIFIC AREA																																	
Canton Island	9	1009.5	1010.0	92	79	85.1	-----	97	26	76	8	21	0	75	75	.44	------	.21	6	0	.0	0	----	----	---	----	--	5	18	8	5.9	—	0
Hilo	28	1013.2	1014.8	82	67	74.8	-----	85	4	62	18	0	0	68	84	26.10	------	8.88	30	1	.0	0	5.3	SW	23	E	°11	0	10	21	8.3	30	0
Honolulu CO	12	------	------	82	73	77.9	+1.1	84	4	67	30	0	0	--	--	6.54	+4.99	2.40	13	4	.0	0	----	----	---	----	--	--	--	--	----	—	0
Honolulu	7	1014.6	1015.3	84	73	78.6	-----	87	25	69	24	0	0	68	72	5.83	------	2.81	16	4	.0	0	10.3	ENE	35	SE	27	7	13	11	6.2	63	0
Lihue	115	1009.8	1014.9	83	72	77.6	-----	86	28	65	25	0	0	70	77	7.83	------	4.99	18	2	.0	0	9.4	ENE	29	S	29	2	15	14	7.1	55	0
Wake Island	9	1013.5	1013.8	87	78	82.1	-----	89	1	74	9	0	0	75	79	4.83	------	1.38	21	1	.0	0	13.9	E	--	----	--	10	13	8	5.2	—	0
Yap Island	51	1008.5	1010.2	89	75	82.2	-----	92	25	70	15	16	0	—	—	10.30	------	2.49	22	5	.0	0	----	----	---	----	--	1	11	19	7.8	—	0
PUERTO RICO																																	
San Juan CO	47	------	------	86	75	80.6	+.8	93	3	72	°27	2	0	--	—	5.19	-.67	1.10	20	6	.0	0	----	----	—	----	--	--	—	--	----	—	0
San Juan	9	1011.2	1013.2	87	75	80.9	-----	92	3	72	28	3	0	73	82	6.30	------	1.65	16	6	.0	0	4.7	S	26	S	10	6	15	10	5.9	58	0
ALASKA																																	
Anchorage	134	1006.8	1011.9	40	24	31.6	-4.4	53	1	12	22	0	28	26	75	.88	-.99	.47	11	0	3.1	1	5.9	N	38	S	3	9	5	17	6.5	42	1029
Annette Island	110	1008.5	1012.5	49	39	44.1	-2.6	58	7	33	24	0	0	37	76	9.44	-5.98	2.27	20	0	T	0	12.5	NE	47	SE	7	1	5	25	8.9	--	641
Barrow	22	1013.9	1014.4	28	17	22.6	+5.7	35	18	-5	29	0	31	20	86	.79	+.24	.25	10	0	8.8	9	13.7	ESE	29	NE	7	1	4	26	8.5	--	1308
Bethel	21	1007.5	1008.8	38	24	30.3	-.8	51	16	11	13	0	28	27	81	1.83	+.08	.65	9	0	6.5	2	----	NE	26	SE	2	8	7	16	6.5	—	1057
Cordova	40	1008.5	1010.2	46	27	36.5	-3.8	52	2	15	18	0	23	31	78	9.81	-2.85	1.89	13	0	!T	0	2.9	ENE	46	E	5	8	4	19	7.0	--	880
Fairbanks	436	997.3	1015.2	32	12	22.3	-5.0	41	2	-6	29	0	31	15	71	.46	-.51	.20	5	0	4.0	4	4.2	N	25	ENE	19	7	9	15	6.9	--	1317
Galena	94	1008.1	1012.9	30	14	22.0	-4.5	41	1	-2	22	0	31	18	79	.28	-.30	.21	6	0	6.8	2	8.1	E	34	E	3	10	6	15	6.0	--	1306
Gambell	25	1008.8	1009.8	35	30	32.5	+1.0	43	17	22	27	0	23	29	85	1.71	+.31	.52	16	0	12.0	1	22.2	NE	—	----	--	2	4	25	8.6	--	996
Juneau	15	1012.6	1013.5	44	32	37.9	-3.3	56	7	19	31	0	15	31	77	3.65	-4.67	1.54	14	0	T	0	5.6	E	43	SE	7	4	6	21	7.9	21	834
Kotzebue	10	1012.9	1013.5	29	19	24.0	-.9	38	1	1	28	0	31	20	78	.81	+.24	.45	10	0	8.8	6	15.9	N	45	E	29	13	6	12	5.1	—	1262
McGrath	334	999.7	------	33	16	24.4	-3.2	45	25	0	23	0	30	—	--	.62	-1.12	.27	7	0	3.3	2	3.6	ENE	36	SSW	3	10	5	16	6.2	--	1251
Nome	13	1010.5	1011.2	36	23	29.6	+.2	46	18	10	12	0	30	24	76	.77	-.81	.53	7	0	2.8	1	10.7	NE	43	NE	28	14	3	14	5.3	—	1090
Northway	1713	951.9	1016.9	27	6	16.5	-8.3	46	1	-12	19	0	31	11	73	.02	-.49	.01	2	0	.2	T	2.5	NW	—	----	--	8	7	16	6.2	--	1494
St. Paul Island	22	1003.4	1004.4	43	35	39.1	+.1	47	17	27	2	0	9	36	85	3.66	+.34	------	20	0	.2	T	----	----	—	----	--	0	12	19	8.1	--	795
Umiat	337	1004.5	1018.0	18	2	10.2	-2.2	40	2	-17	11	0	31	9	85	.69	+.18	.36	10	0	6.9	6	5.0	WSW	24	WSW	4	8	5	18	6.9	—	1675
Wales	9	1011.2	1011.9	34	24	29.2	-1.4	47	16	14	10	0	28	--	--	.51	-.63	.13	8	0	2.0	2	----	----	--	----	--	5	11	15	6.6	—	1100
Yakutat	28	1010.5	------	48	32	39.8	-1.8	55	10	19	30	0	15	--	—	7.74	-11.57	4.24	13	0	!T	0	5.6	E	36	E	18	6	4	21	7.5	--	774

Data from airport unless otherwise specified. CO indicates data from city office.

* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic wind instrument.

° Other dates also.

** Peak gust data.

! Melted as it fell.

§ Max 70° F or above for Alaskan Stations.

HEATING DEGREE DAYS

Table 3 (Base 65°F.) OCTOBER 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	86	88	100
Mobile (CO)	31	31	44
Mobile	31	31	
Montgomery (CO)	31	31	72
Montgomery	35	35	75
ARIZONA			
Flagstaff	563	861	900
Payson (CO)	210	233	
Phoenix (CO)	8	8	18
Phoenix	11	11	
Prescott	281	301	
Tucson	18	18	
Winslow	249	255	
Yuma	3	3	9
ARKANSAS			
Ft. Smith	115	123	135
Little Rock	120	126	127
Texarkana	73	73	
CALIFORNIA			
Bakersfield	52	52	60
Beaumont (CO)	114	128	
Bishop	261	272	307
Blue Canyon	433	575	
Burbank	44	46	
Eureka (CO)	303	1157	1168
Fresno	89	89	82
Los Angeles (CO)	14	15	58
Los Angeles	26	30	
Mt. Shasta (CO)	471	597	
Oakland	123	361	376
Red Bluff	78	80	109
Sacramento (CO)	82	88	116
Sacramento	100	104	
Sandberg (CO)	276	317	
San Diego	17	18	81
San Francisco (CO)	123	793	648
San Francisco	153	552	552
Santa Catalina	87	244	
Santa Maria	110	393	
COLORADO			
Alamosa	680	1059	
Colorado Springs	528	755	
Denver	513	681	544
Grand Junction	383	419	404
Pueblo	462	583	467
CONNECTICUT			
Bridgeport	274	338	
Hartford	331	437	491
New Haven	308	383	441
DELAWARE			
Wilmington	214	261	
DIST. OF COLUMBIA			
Washington (CO)	152	174	290
Washington	140	162	
FLORIDA			
Apalachicola	4	4	18
Daytona Beach	2	2	
Fort Myers	0	0	1
Jacksonville (CO)	8	8	24
Jacksonville	7	7	
Key West (CO)	0	0	0
Key West	0	0	
Melbourne	0	0	
Miami (CO)	0	0	0
Int. Airport, Hialeah	0	0	
Miami Beach	0	0	
Orlando	0	0	
Pensacola (CO)	14	14	32
Tallahassee	8	8	
Tampa	0	0	5
West Palm Beach	0	0	
GEORGIA			
Albany	19	19	44
Atlanta (CO)	83	86	141
Atlanta	73	76	
Athens	77	80	
Augusta	37	37	85
Columbus	39	39	
Macon	32	32	92
Rome	94	97	
Savannah	'20	20	43
Valdosta	16	16	
IDAHO			
Boise	482	594	547
Lewiston	475	589	
Pocatello	586	776	684
ILLINOIS			
Cairo (CO)	155	179	200
Chicago (CO)			431
Chicago	342	460	
Joliet	367	532	
Moline	350	487	
Peoria	334	456	435
Springfield (CO)	260	331	346
Springfield	291	392	
INDIANA			
Evansville	226	282	246
Ft. Wayne	328	484	490
Indianapolis (CO)	226	295	368
Indianapolis	281	394	
South Bend	366	549	
Terre Haute	274	382	
IOWA			
Burlington	333	460	391
Charles City (CO)	460	709	676
Davenport (CO)	327	432	429
Des Moines	403	557	467
Dubuque	459	701	554
Keokuk (CO)			378
Sioux City	457	674	548
KANSAS			
Concordia (CO)	345	458	347
Dodge City	350	450	333
Goodland	476	660	433
Topeka (CO)	308	392	313
Topeka	315	406	
Wichita	293	352	218
KENTUCKY			
Lexington	229	283	304
Louisville (CO)	184	222	263
Louisville	224	269	
LOUISIANA			
Baton Rouge	32	32	45
Lake Charles	17	17	
New Orleans (CO)	7	7	23
New Orleans	11	11	
Shreveport	39	39	75
MAINE			
Caribou	644	1143	
Eastport	485	859	1088
Greenville (CO)			1140
Portland	491	727	724
MARYLAND			
Baltimore (CO)	148	171	257
Baltimore	196	235	
Frederick	216	262	
MASSACHUSETTS			
Boston	309	377	458
Nantucket	291	355	434
Pittsfield	477	810	
MICHIGAN			
Alpena (CO)	513	907	896
Detroit	332	463	541
Escanaba (CO)	586	1034	957
Grand Rapids (CO)	371	528	578
Grand Rapids	409	637	
Lansing	408	640	664
Marquette (CO)	597	1152	1005
Muskegon	439	704	
Sault Ste. Marie	615	1260	1088
Ypsilanti	342	494	
MINNESOTA			
Duluth (CO)	707		1068
Duluth	706	1389	
International Falls	757	1434	
Minneapolis	506	772	668
Rochester	505	799	
St. Cloud	609	996	849
St. Paul	505	764	674
MISSISSIPPI			
Jackson	57	57	85
Meridian	67	67	89
Vicksburg	51	51	76
MISSOURI			
Columbia	256	340	320
Kansas City	279	348	291
St. Joseph	328	424	331
St. Louis (CO)	211	253	246
St. Louis	234	291	
Springfield	254	323	277
MONTANA			
Billings	620	1031	
Butte	831	1674	
Glasgow (CO)	682	1113	
Great Falls	709	1274	
Havre (CO)	727	1194	938
Helena	730	1286	996
Kalispell	734	1333	1136
Miles City	643	1043	
Missoula	663	1119	978
NEBRASKA			
Grand Island	455	663	
Lincoln (CO)	372	496	416
Lincoln	410	567	
Norfolk	471	697	
North Platte	520	764	545
Omaha	387	521	433
Scottsbluff	525	980	
Valentine (CO)	544	865	670
NEVADA			
Elko	645	891	
Ely	672	938	
Las Vegas	86	86	
Reno	558	702	585
Winnemucca	593	771	726
NEW HAMPSHIRE			
Concord	465	719	749
Mt. Washington	951	2747	
NEW JERSEY			
Atlantic City	157	187	289
Newark	239	287	367
Trenton	232	278	352
NEW MEXICO			
Albuquerque	200	203	255
Clayton	364	467	352
Raton	473	640	
Roswell	112	229	217
NEW YORK			
Albany	418	608	564
Bear Mountain (CO)	394	574	
Binghamton	434	712	650
Buffalo	348	534	596
New York (CO)	212	256	327
La Guardia Field	191	229	
Oswego	355	557	640
Rochester	365	550	584
Syracuse	377	563	619
NORTH CAROLINA			
Asheville (CO)	195	214	294
Asheville	195	214	
Charlotte	91	100	161
Greensboro	134	154	245
Hatteras	16	16	60
Raleigh (CO)	86	95	182
Raleigh	110	125	
Wilmington (CO)	43	44	93
Winston-Salem	131	149	
NORTH DAKOTA			
Bismarck	680	1090	898
Devils Lake (CO)	768	1274	1086
Fargo	665	1058	904
Grand Forks			1029
Williston (CO)	695	1165	999
OHIO			
Akron	334	527	517
Cincinnati (CO)	191	224	319
Cincinnati	247	319	
Cleveland (CO)	250	353	468
Cleveland	265	386	
Columbus	297	399	382
Dayton	280	377	394
Sandusky (CO)	255	347	440
Toledo	325	469	505
Youngstown	329	521	
OKLAHOMA			
Oklahoma City (CO)	171	197	168
Oklahoma City	172	190	
Tulsa	172	188	
OREGON			
Baker (CO)	597	891	919
Burns (CO)	618	844	
Eugene	363	510	
Meacham	669	1085	
Medford	383	433	456
Pendleton	426	521	
Portland (CO)	290	379	457
Portland	343	491	
Roseburg (CO)	316	369	480
Salem	362	530	
Sexton Summit (CO)	515	770	
Troutdale	358	511	
PENNSYLVANIA			
Allentown	322	416	
Curwensville	431	766	
Erie (CO)	272	391	481
Harrisburg	274	334	387
Park Place	402	613	
Philadelphia (CO)	170	194	273
Philadelphia	184	220	
Pittsburgh (CO)	221	295	384
Pittsburgh	254	353	447
Reading (CO)	228	278	362
Scranton (CO)	335	473	533
Williamsport	345	452	483
RHODE ISLAND			
Block Island	264	318	404
Providence (CO)	277	350	468
Providence	325	420	
SOUTH CAROLINA			
Charleston (CO)	17	17	46
Charleston	30	30	
Columbia (CO)	36	40	98
Columbia	47	49	
Florence	55	57	
Greenville	75	78	139
Spartanburg	93	98	
SOUTH DAKOTA			
Huron	580	885	691
Pierre			589
Rapid City	663	1008	728
Sioux Falls	546	852	
TENNESSEE			
Bristol	202	239	
Chattanooga	111	114	146
Knoxville	140	149	202
Memphis	134	144	147
Nashville	165	182	183
TEXAS			
Abilene	77	87	104
Amarillo	231	303	269
Austin	14	14	33
Big Spring	73	79	59
Brownsville	0	0	8
Corpus Christi	0	0	12
TEXAS (Cont'd.)			
Dallas	56	56	76
Del Rio (CO)	0	0	35
El Paso	21	21	94
Ft. Worth	52	52	76
Galveston (CO)	0	0	15
Galveston	0	0	
Houston (CO)	1	1	
Houston	3	3	27
Laredo	0	0	
Lubbock	166	195	
Palestine (CO)	33	33	71
Port Arthur (CO)	4	4	26
Port Arthur	15	15	
San Angelo	46	51	
San Antonio	2	2	31
Victoria	3	3	
Waco	35	35	
Wichita Falls	94	105	
UTAH			
Milford	496	564	
Salt Lake City (CO)	396	436	458
Salt Lake City	443	508	529
VERMONT			
Burlington	459	699	780
VIRGINIA			
Cape Henry	47	52	128
Lynchburg	179	212	269
Norfolk (CO)	63	71	138
Norfolk	95	108	
Richmond (CO)	138	155	218
Richmond	161	183	
Roanoke	192	230	282
WASHINGTON			
Ellensburg	563	784	
Kelso	410	696	
North Head (CO)	354	1047	1021
Olympia	445	682	
Port Angeles	462	1295	
Seattle (CO)	346	536	572
Spokane	591	836	730
Stampede Pass (CO)	791	1669	
Stevenson (CO)	372	531	
Tacoma (CO)	401	656	726
Tatoosh Island (CO)	409	1382	1349
Walla Walla (CO)	372	427	425
Yakima	515	692	562
WEST VIRGINIA			
Charleston	206	268	
Elkins	341	545	554
Huntington	174	213	
Parkersburg (CO)	248	319	359
Petersburg	244	326	
WISCONSIN			
Green Bay	533	896	728
La Crosse (CO)	427	650	640
La Crosse	445	677	
Madison (CO)	454	681	607
Madison	472	722	
Milwaukee (CO)	411	594	571
Milwaukee	440	665	
WYOMING			
Casper	635	986	
Cheyenne	650	1078	916
Lander	661	1017	960
Rock Springs	704	1062	
Sheridan	646	1067	
ALASKA			
Anchorage	1029	2002	
Annette Island	641	1389	
Barrow	1308	3568	4141
Bethel	1057	2377	2367
Cordova	880	2003	
Fairbanks	1317	2223	2297
Galena	1306	2520	
Gambell	996	3056	
Juneau	834	1695	
Kotzebue	1262	2846	
McGrath	1251	2384	
Nome	1090	2781	2758
Northway	1494	2569	
St. Paul	795	2448	
Umiat	1675	4772	
Wales	1100	4005	
Yakutat	774	1837	

Data from airport unless otherwise specified. CO indicates data from city office.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Florida, southern portion	2	All day					$400,000	$1,600,000	Tropical storm	Center of storm crossed Florida from near Fort Myers to Vero Beach. Very heavy rains attended central path of storm over Florida, with totals ranging from 8 to 13 inches, but no strong winds occurred near the center. The strong winds were all in squalls along lower east coast and over Keys, where speeds of 50 to 60 m.p.h. were registered. Minor damage to small craft, and a few windows and awnings lost along coast from Key West to West Palm Beach. Greatest damage from rains that flooded farms and pasture lands over a broad belt extending from Naples, Fort Myers, and Punta Gorda on the west coast to Stuart, Fort Pierce, and Vero Beach on the east. Early fall crops flooded out in rich Okeechobee farming area. Many cattle had to be moved out of flooded area, and quite a few were lost by drowning or starvation. Roadways damaged and several bridges washed out.
Battleground (near), Clark County, Wash.	2	3:10-3:40 p.m.	35	8	0	0	10,000	Slight	Tornado	During a general rainstorm, accompanied by thunder and lightning, a destructive twisting wind, apparently a small tornado, did considerable property damage in limited area west of town of Battleground. This destructive whirling storm began 3 miles west of Battleground, passed about 1 mile north, and ended 4 or 5 miles east of town. Wind velocities very high in a central path about 35 yards in width. Center of this tornado moved eastward at a leisurely, but erratic pace, requiring 30 minutes to traverse path of 7 to 8 miles long. Some destruction in cornfields. A number of fruit trees uprooted, some of which appear to have been pulled almost straight upward from ground. Principal property loss was total destruction of a large 2-story barn at Cherry Grove, about 1 mile west of Battleground.
Oakland, Nebr.	2	Evening					200,000	Little	Hail	Most damage to buildings and automobiles. Storm did not extend beyond town.
Phillips, Smith and Jewell Counties, Kans.	3	5:10-9:45 p.m.	•½ to 11	75			29,000	12,000	Wind and hail (some tornadic characteristics)	Series of storms began 7 miles west of Phillipsburg in Phillips County, with heavy hail and wind damage to property in Phillipsburg and to crops southeast of town. Wind and hail reached Smith County about 6 p.m. with light damage, mostly to trees. At 8 p.m. heavy winds with tornadic characteristics accompanied by hail struck western Jewell County from Esbon to 15 miles east-southeast. Storm of lighter proportions in Burr Oak area about 9:45 p.m. Property damage by wind, $21,500; by hail, $7,500. Crop damage by wind, $8,000; by hail, $4,000.
Montgomery County, Kans.	4	8:45 p.m.					2,500		Electrical	Lightning caused fire which burned barn and contents 5 miles south of Coffeyville.
Butler County, Kans.	5	Morning					500		do	Fire caused by lightning damaged loft and one side of barn and destroyed a quantity of hay near Potwin before being brought under control.
Fayette County, Ky.	5	5-6:30 p.m.				1	1,000	5,000	Wind, rain, hail, and electrical	Trees and wires downed in several sections. Winds reached 75 m.p.h. at Blue Grass Airport. Two acres of tobacco and 800 bales of hay housed in a barn destroyed or damaged when structure was burned after being struck by lightning. Injury caused by lightning.
Beaver County, Okla.	5	5:30-6:30 p.m.						500	Hail	Damage to gardens in city of Beaver and a little to crops in adjacent farm areas. Hail as much as 2 inches deep in some areas. As practically no wind accompanied hail, little damage done to property.
Reed to Granite in Greer County and adjacent areas in Harmon and Kiowa Counties, Okla.	5	6:05-6:45 p.m.	•5	70		2	75,000	175,000	Hail, wind, and electrical	Hail 1 to 1½ inches in diameter; crops suffered 75 to 100 percent damage; over 18,000 acres damaged, mostly to cotton and sorghums. Most of damage in Greer County in a strip 23 miles long. Considerable damage to buildings and automobiles. Winds blew one house from foundation 8 miles southwest of Mangum injuring two persons. Lightning struck a barn 5 miles southeast of Granite, setting it afire, with total loss. Crop damage a result of hail. Property damage, $70,000 result of hail, $2,000 result of wind, and $3,000 electrical; included in total. Earliest reports received from Highway Patrol and distributed over CAA teletypewriter Service C, indicated this to be a tornado. No confirmation of this could be obtained, and reliable sources from vicinity indicated a straight-line windstorm occurred rather than a tornado.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Burgettstown, Pa.	5	Evening					See remarks		Electrical	Lightning damaged two houses, setting one afire.
Reno County, Kans.	5	10 p.m.					$2,900		do	Fire caused by lightning destroyed a large barn and 25 tons of alfalfa hay on farm 3½ miles southeast of Haven.
Marion County, Kans.	5	Evening					2,000		do	Lightning set fire to barn near Peabody, which burned to ground. Contents of hay and grain also lost.
Alaska, southeastern portion	7	7 a.m.-midnight					10,000		Wind	Storm moved from Queen Charlotte Island northeastward to Ketchikan and Juneau. It capsized a small boat near Ketchikan, smashed many windows, damaged poorly constructed buildings, and blew down trees. Fish and Wildlife Service boat Polar Bear enroute from Prince of Wales Island to Ketchikan suffered a broken mast and had one side of pilot house smashed and its hatch washed overboard. A pump house at Standard Oil yard at Juneau almost totally wrecked when blown from new foundation and dumped into the flume which runs by plant. A landslide also occurred at Juneau which came within 50 yards of a house. At Matanuska trolling boat Hazel M considered a total loss when wind and wave damaged pilot house and flooded engine. A small bridge in Ward Lake area collapsed with a car on it, dumping the machine into a creek. Within 10-mile radius of Juneau damage to property $5,000; within 20-mile radius of Ketchikan property damage $5,000.
Wilkes-Barre area, Pa.	7	7 a.m.-8:30 p.m.				1	See remarks		Electrical, winds, and rain	Man shocked and stunned when lightning struck near him. Lightning damaged some power lines, while telephone and power lines were damaged by falling branches. Sudden rains flooded several streets with up to 1 foot of water. Lightning ripped a 4-foot hole in siding of a home, causing $1,000 damage.
Pittsburgh area, Pa.	7	Daytime					See remarks		Winds	Winds with gusts to 56 m.p.h. damaged utility lines, with wires down at several points in Pittsburgh.
Pennsylvania, south-central portion	7	Daytime			1	6			Rains	Heavy rains which made highways slippery, resulted in one fatality and six injuries in highway accidents near Columbia, York, and Amity Hall. Two other deaths and 16 other injuries may have been due partially to the rains.
Bedford County, Va.	7	2-3 p.m.					1,500	$1,850	Electrical	At Goodview, barn containing much hay and straw struck by lightning and destroyed. At Thaxton, lightning caused minor damage to a house.
Warminster, Va.	7	Afternoon			1				do	A saw-mill employee struck and killed by lightning.
Marcus Hook, Pa.	7	Afternoon					See remarks		do	Lightning struck transformer and started fire at Sinclair Refinery Company tower.
Halifax County, Va.	7	4-5 p.m.				1	3,000	500	Wind	Extensive damage in central section of County to buildings. Some corn blown down; tobacco damaged by toppled barns where it was stored.
Long Island, N. Y.	7	8-10 p.m.					Considerable		Wind and rain	Heavy rain with winds reaching speeds around 50 m.p.h. disrupted power and telephone services, and flooded streets and cellars. One store owner in Hempstead estimated his loss at $15,000.
Essex and Union Counties including Newark and North Jersey metropolitan area, all of shore area, and Mercer and Burlington Counties including Trenton area, N. J.	7	Most of day	*60	100	4	20	10,000	Slight	Rain, wind, and electrical	Most of north and north-central portions felt effects of severe electric storm, accompanied by heavy rains. Deaths and injuries were in traffic accidents caused by storm. Power out in many areas for several hours. Some damage to roofs, trees, and power and telephone lines by high winds. Heavy seas washed considerable sand and debris over shore roads. Flash flooding responsible for many traffic tie-ups. Crop damage slight due to lateness of season.
Gooding and Lincoln Counties, Idaho	10	4 to 6:30 p.m.						3,500	Wind	Damage to crops still in fields: beans, $1,000; hay, $1,000; clover seed, $1,500. Also, some soil erosion.
Mora (vicinity of), Minn.	14	3-4:30 a.m.					8,000		Electrical	A barn struck by lightning and entirely destroyed by fire. Loss included farm machinery, 75 tons of hay, and a calf.

See footnotes at end of table.

Table 4--Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Raymond, Mont.	14						Small		Wind	Strong gusty wind blew throughout day.
Bristow (7 miles northeast of), CreekCounty Okla.	14					1			Electrical	Woman struck by lightning while in church service.
Bressie Township (8 miles southwest of Redrock), Noble County, Okla.	21	8:30 p.m.	880	2	0	0	$5,000	$1,000	Tornado, and hail	Path eastward, accompanied by heavy hail. Estimated hail damage to cotton, corn, and sorghums $1,000. Tornado damage to 3 sets of farm buildings estimated at $5,000.
Montgomery and Neosho Counties, Kans.	21	10:30 p.m.					3,500		Wind and electrical	Near Cherryvale in Montgomery County, a plane anchored in pasture blown over fence and smashed into brooder house. East of Chanute in Neosho County, brick building blown down, roof torn from hay barn, and upper section of large barn moved. Lightning caused fire which destroyed barn in eastern Neosho County, just west of Walnut. Damage by wind, $2,200; by lightning, $1,300.
Steve (2 miles east of), Yell County, Ark.	23	3 a.m.			0	4	See remarks		Tornado	One home and all contents completely destroyed, injuring 4 persons in house, 2 of them seriously. No evidence of storm having struck anywhere else in vicinity; houses and outbuildings within 100 yards or less of this home were not damaged.
Saginaw Bay, Mich.	23						See remarks		Wind	Northeasterly winds damaged shore properties on Saginaw Bay.
Lake Michigan Shore, Ind.	24	2 a.m.					25,000	0	do	High winds on Lake Michigan caused high waves which eroded shore.
New England, northern portion	28-29	5 p.m.-5 a.m.			1		Minor		Snow	Three to 6 inches of wet snow fell in northern parts of Maine, New Hampshire, and Vermont. In Aroostook, Piscataquis, and Penobscot Counties, Maine 100 poles felled, and 99 phone circuits knocked out. Boy scout from Bangor, lost in woods near East Eddington, died of exposure.
Tucson, Ariz.	29-30	5:30 p.m., 29th-3:25 p.m.-30th	*40	40			2,000	200,000	Rain	Steady rain soaked cotton crop in fields and lowered grade to account for estimated loss of $200,000 to value of crop. Some flood damage in Tucson, including damage to sewer excavations, telephone cables, etc.
Wisconsin, entire State	30	P.m.					25,000		Winds	High winds over most of Wisconsin uprooted some trees, broke many tree branches, and disrupted electric power and telephone services in some areas. Five to 6 inches of snow in extreme northwestern part of State drifted badly because of wind. Visibility reduced to less than ½ mile because of blowing snow. Highway travel seriously hampered by near-blizzard conditions.
Marquette, Mich.	31						See remarks		do	Highest winds since October 1949 disrupted utility services.
Alpena, Mich.	31						Minor		do	
Sault Ste. Marie, Mich.	31						See remarks		do	Storm on Lake Superior raised water in St. Marys River, flooding parts of city and locks area. Winds damaged docks and boats. Lightship Gros Cap blown off its position.

* Miles instead of yards.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

OCTOBER 1951

No significant flooding was reported in the United States during October. The only flooding reported was scattered slight overflows in the Mississippi and Columbia Basins. Record to near record low stages were reached in some streams in the Atlantic Slope Drainage.

ATLANTIC SLOPE DRAINAGE.—Continued deficient rainfall kept streams and rivers at low levels. The Pee Dee River at Pee Dee, S. C., reached a new record low stage of 1.45 feet on the 9th. The previous low stage was 2.4 feet recorded on September 23, 1947. The Lynches River reached a low stage of 1.63 feet, within 0.2 foot of the record 52 year stage.

MISSISSIPPI SYSTEM.—Slight flooding occurred along the Rock River at Moline, Ill., during the last 7 days of October and the first 6 days of November. The overflow was due to rainfall totaling 3 to 4 inches which occurred between the 16th and the 24th. Some inconvenience resulted to vehicle and pedestrian traffic, but there was no damage of consequence since little monetary loss occurs in that area until a stage of 13 feet or higher is attained.

Bankfull stage was exceeded slightly along the Meramec River at Pacific, Mo., on the 25th due to rainfall averaging 2 inches during the 48-hour period ending at 7 a.m. on the 23d.

A slight overflow occurred along the Lamine River at Clifton City, Mo., during the morning of the 24th. This rise was due to showers totaling 1 to 2 inches on the 22d and 23d.

PACIFIC SLOPE DRAINAGE - COLUMBIA BASIN.—Minor flooding occurred on the Willamette River at Harrisburg, Oreg., and on the Lower Santiam at Jefferson, Oreg., between the 23d and 24th due to moderate to heavy rainfall on the 21st, 22d, and 23d. No damage resulted from the flooding.

FLOOD STAGE DATA

Table 5 (All dates in October unless otherwise specified) OCTOBER 1951

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			*Ft.*	
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Rock: Moline, Ill.	10	25	**	10.5	28–29
Meramec: Pacific, Mo.	11	25	25	11.1	25
Lamine: Clifton City, Mo.	15	24	24	16.5	24
PACIFIC SLOPE DRAINAGE Columbia Basin					
Santiam: Jefferson, Oreg.	13	23	24	15.8	23
Willamette: Harrisburg, Oreg.					

* Provisional.
** Continued at end of month.

RADIOSONDE DATA

Average monthly values

Standard pressure surface (mb.)	ALBANY, N. Y. (1010 MB.)				ALBUQUERQUE, N. MEX. (839 MB.)				ATLANTA, GA. (984 MB.)				BIG SPRING, TEX. (926 MB.)				BISMARCK, N. DAK. (957 MB.)				BOISE, IDAHO (917 MB.)				BROWNSVILLE, TEX. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	86	9.2	85	31	1,620	15.6	36	31	307	17.3	75	31	784	20.2	49	31	505	5.6	79	31	868	8.7	73	31	6	23.3	81
1,000	31	168	10.6	77	31	95			31	167			31	111			31	141			31	142			31	136	24.2	75
950	31	596	9.7	68	31	549			31	613	17.8	65	31	560			31	569			31	576			31	569	21.7	71
900	31	1,043	8.0	64	31	1,021			31	1,069	15.6	63	31	1,032	20.8	44	31	1,010	6.1	67	31	1,026	11.9	54	31	1,054	19.4	64
850	31	1,514	6.6	55	31	1,508			31	1,553	13.7	53	31	1,523	18.3	44	31	1,476	3.7	64	31	1,503	9.1	48	31	1,544	17.1	55
800	31	2,010	5.2	49	31	2,024	14.8	29	31	2,062	11.7	44	31	2,040	15.7	40	31	1,967	2.2	58	31	2,002	5.5	50	31	2,060	14.5	52
750	31	2,537	3.3	46	31	2,571	10.9	32	31	2,608	8.8	39	31	2,587	11.9	42	31	2,495	-0.2	56	31	2,532	1.8	53	31	2,612	11.9	45
700	31	3,092	0.7	44	31	3,136	6.4	37	31	3,167	5.3	38	31	3,158	7.7	49	31	3,035	-3.0	54	31	3,079	-1.7	53	31	3,178	9.2	39
650	31	3,687	-2.2	43	31	3,742	1.7	42	31	3,775	1.8	36	31	3,767	3.3	52	31	3,625	-6.2	51	31	3,671	-4.9	49	31	3,797	5.9	35
600	31	4,316	-5.6	36	31	4,380	-2.9	45	30	4,410	-1.8		31	4,408	-1.2	49	31	4,241	-10.1	49	31	4,290	-8.5	44	31	4,440	1.8	35
550	30	4,995	-9.6		31	5,066	-7.4	35	30	5,102	-5.7		31	5,097	-5.6	35	31	4,912	-14.3	49	30	4,967	-12.9	43	31	5,144	-2.4	36
500	30	5,725	-14.3		31	5,799	-12.1		30	5,837	-10.6		30	5,839	-10.3		30	5,616	-19.4	49	30	5,684	-17.7	43	31	5,888	-6.8	34
450	30	6,518	-19.8		31	6,604	-17.3		30	6,648	-16.2		29	6,650	-15.7		30	6,396	-25.0	46	30	6,472	-23.1	42	31	6,716	-12.1	
400	29	7,379	-25.9		31	7,470	-24.0		30	7,514	-22.5		29	7,521	-22.0		30	7,236	-31.6	48	30	7,318	-28.9		31	7,595	-18.4	
350	29	8,332	-32.9		31	8,430	-31.0		29	8,480	-29.5		29	8,489	-29.1		30	8,166	-38.6	46	30	8,258	-36.1		31	8,577	-25.6	
300	29	9,398	-41.1		31	9,505	-39.1		28	9,557	-37.4		29	9,572	-37.4		29	9,206	-46.4		30	9,311	-44.1		31	9,675	-33.8	
250	29	10,615	-49.6		29	10,733	-48.1		28	10,793	-46.0		28	10,802	-46.7		28	10,403	-54.1		29	10,505	-52.0		31	10,928	-43.5	
200	29	12,049	-57.4		29	12,176	-56.1		28	12,246	-55.2		24	12,246	-56.7		27	11,816	-57.8		27	11,916	-56.6		31	12,393	-54.6	
175	28	12,900	-60.2		28	13,010	-60.1		28	13,088	-59.8		24	13,083	-61.2		27	12,657	-57.8		27	12,760	-57.2		31	13,235	-60.4	
150	28	13,857	-61.5		28	13,964	-63.4		28	14,042	-63.8		24	14,029	-65.4		27	13,629	-57.6		27	13,734	-57.2		31	14,182	-66.3	
125	25	14,975	-62.6		28	15,075	-66.3		26	15,153	-66.8		21	15,131	-69.1		27	14,778	-57.9		27	14,884	-58.1		31	15,271	-71.5	
100	24	16,350	-63.1		26	16,412	-67.7		24	16,494	-68.7		19	16,459	-70.9		25	16,172	-57.7		25	16,288	-59.0		26	16,577	-73.7	
80	20	17,739	-61.3		22	17,758	-66.3		20	17,838	-67.0		15	17,790	-67.5		23	17,582	-57.9		24	17,692	-58.5		19	17,888	-69.9	
60	13	19,530	-60.1		17	19,525	-62.1		16	19,588	-63.6		12	19,532	-63.1		16	19,413	-58.0		20	19,491	-58.3		16	19,619	-62.2	
50	5	20,679	-60.6		15	20,648	-60.8		15	20,714	-61.5		10	20,658	-61.3		11	20,599	-57.1		16	20,624	-57.6		13	20,758	-58.3	
40					13	22,055	-58.2		14	22,112	-58.9		10	22,050	-58.7						13	22,000	-57.2		9	22,169	-54.7	
30					12	23,873	-55.9		13	23,933	-55.1		9	23,869	-55.2						10	23,829	-56.3		8	24,033	-50.5	
20					6	26,452	-53.5		11	26,548	-52.2		5	26,482	-52.7													

Standard pressure surface (mb.)	BUFFALO, N. Y. (993 MB.)				BURRWOOD, LA. (1017 MB.)				CAMAGUEY, CUBA (1000 MB.)				CARIBOU, ME. (997 MB.)				CHARLESTON, S. C. (1017 MB.)				CIUDAD VICTORIA, MEX. (975 MB.)				COLUMBIA, MO. (989 MB.)			
SURFACE	31	221	10.8	78	31	3	22.6	86	26	122	23.1	96	31	191	5.2	82	31	13	18.6	84	30	335	25.2	67	31	239	13.6	74
1,000	31	164			31	149	22.3	79	26	122			31	166			31	154	20.7	73	30	114			31	145		
950	31	599	12.2	63	31	596	19.7	74	26	584	23.8	79	31	591	6.6	67	31	605	18.9	70	30	570	24.1	65	31	583	14.4	66
900	31	1,047	9.7	59	31	1,059	17.1	68	26	1,046	21.3	76	31	1,030	5.0	65	31	1,061	16.4	71	30	1,039	20.8	69	31	1,036	12.3	64
850	31	1,519	7.5	53	31	1,545	14.7	58	26	1,541	18.6	71	31	1,494	3.2	62	31	1,546	14.0	67	29	1,530	17.3	71	31	1,514	10.5	60
800	31	2,017	5.4	48	31	2,056	12.6	49	26	2,059	15.8	68	31	1,985	1.7	56	31	2,056	11.5	59	29	2,046	14.3	67	31	2,018	8.6	53
750	31	2,544	3.4	43	31	2,602	10.1	44	26	2,607	12.7	65	31	2,513	-0.1	54	31	2,601	8.6	60	29	2,597	11.5	61	31	2,555	6.3	49
700	31	3,099	-0.5	39	31	3,167	7.6	36	26	3,182	9.4	63	31	3,053	-2.5	51	31	3,162	5.7	49	29	3,164	8.9	52	31	3,113	3.1	46
650	31	3,690	-2.7	35	31	3,781	4.4	35	26	3,800	5.9	60	31	3,643	-5.3	44	31	3,770	2.5	41	28	3,783	5.5	49	30	3,711	-0.4	42
600	29	4,326	-5.7	29	31	4,422	0.6	39	26	4,445	2.2	62	31	4,263	-8.6	42	31	4,408	-1.1		27	4,425	1.9	47	30	4,343	-4.6	40
550	29	5,002	-9.6		31	5,121	-3.4	35	26	5,147	-1.7	57	31	4,937	-12.5	45	31	5,101	-4.7		27	5,127	-1.8	42	30	5,027	-8.7	39
500	29	5,732	-14.3		31	5,862	-8.4		26	5,897	-5.9	55	31	5,654	-16.9	42	31	5,841	-9.4		27	5,875	-6.3	41	30	5,754	-13.5	36
450	29	6,521	-20.2		31	6.680	-13.9		26	6,722	-10.5	46	31	6,443	-22.0	37	31	6,653	-14.9		27	6,700	-11.3	37	30	6,550	-19.2	37
400	28	7,382	-26.2	31	30	7,557	-20.3	33	24	7,613	-16.2	45	31	7,294	-28.3	38	31	7,529	-21.1		27	7,587	-17.4		30	7,414	-25.4	
350	28	8,334	-33.1		30	8,531	-27.6		24	8,605	-23.1	47	31	8,238	-35.2		30	8,499	-28.3		26	8,574	-24.7		30	8,368	-32.6	
300	27	9,396	-41.0		30	9,621	-35.8		24	9,716	-31.4	45	29	9,290	-43.1		29	9,587	-36.2		25	9,682	-32.9		30	9,435	-41.0	
250	26	10,610	-49.8		29	10,861	-45.1		24	10,982	-41.0		28	10,508	-51.4		28	10,829	-45.5		23	10,943	-42.5		30	10,649	-50.1	
200	24	12,052	-56.4		29	12,317	-55.3		23	12,465	-52.9		28	11,934	-57.2		28	12,282	-55.7		22	12,411	-54.3		29	12,084	-57.9	
175	24	12,895	-58.9		29	13,158	-60.4		23	13,313	-59.7		28	12,775	-58.5		28	13,122	-60.5		21	13,261	-60.2		29	12,919	-61.2	
150	21	13,866	-59.7		28	14,108	-65.0		22	14,264	-66.5		28	13,742	-58.5		27	14,074	-64.4		19	14,218	-66.2		29	13,870	-63.2	
125	19	14,986	-61.0		27	15,208	-69.7		20	15,350	-73.3		28	14,886	-59.3		27	15,177	-68.5		17	15,300	-72.2		29	14,984	-65.0	
100	18	16,377	-61.7		19	16,507	-70.8		19	16,638	-76.4		27	16,293	-59.2		26	16,513	-69.3		11	16,621	-75.9		27	16,336	-65.1	
80	13	17,761	-59.4		12	17,832	-68.4		18	17,931	-72.3		23	17,687	-58.1		24	17,840	-66.7		7	17,910	-72.0		24	17,708	-63.3	
60	7	19,582	-58.3		11	19,575	-62.7		14	19,651	-66.3		5	19,480	-57.3		17	19,605	-62.8						14	19,499	-60.0	
50					10	20,708	-60.5		9	20,749	-64.0						7	20,759	-60.8						12	20,628	-58.6	
40					8	22,094	-56.4		5	22,160	-59.0																	
30					6	23,900	-53.4																					

Standard pressure surface (mb.)	DODGE CITY, KANS. (925 MB.)				EL PASO, TEX. (882 MB.)				ELY, NEV. (809 MB.)				GLASGOW, MONT. (940 MB.)				GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (887 MB.)				GREENSBORO, N. C. (989 MB.)			
SURFACE	31	792	12.1	67	31	1,195	21.0	35	31	1,908	7.3	45	31	648	6.3	73	31	1,474	10.7	54	31	1,128	5.8	67	31	273	14.2	80
1,000	31	130			31	84			31	120			31	136			31	112			31	131			31	174		
950	31	568			31	544			31	564			31	566			31	559			31	561			31	615	16.4	62
900	31	1,025	13.8	57	31	1,017			31	1,021			31	1,008	6.4	63	31	1,019			31	1,010			31	1,070	13.7	60
850	31	1,507	13.0	52	31	1,513	21.3	30	31	1,500			31	1,475	3.8	63	31	1,497			31	1,477	5.5	58	31	1,551	11.5	62
800	31	2,015	11.3	44	31	2,034	17.3	35	31	2,005	10.3	35	31	1,966	1.7	60	31	2,006	11.2	38	31	1,971	2.8	60	31	2,056	9.4	51
750	31	2,558	8.9	41	31	2,586	12.9	41	31	2,543	7.2	36	31	2,489	-1.3	59	31	2,546	7.2	41	31	2,494	-0.4	63	31	2,596	7.7	38
700	31	3,121	5.6	40	31	3,156	8.7	44	31	3,102	2.7	41	31	3,030	-4.4	56	31	3,104	2.9	44	31	3,039	-3.4	61	31	3,156	4.9	34
650	31	3,725	1.6	36	31	3,764	3.9	46	31	3,698	-1.4	42	31	3,619	-7.6	55	31	3,704	-1.5	46	30	3,625	-7.0	60	31	3,760	1.4	34
600	31	4,362	-2.8	34	31	4,409	-0.6	43	31	4,330	-5.5	39	31	4,230	-11.2	53	31	4,331	-5.8	45	30	4,240	-11.2	57	31	4,396	-2.4	
550	31	5,048	-7.3		31	5,098	-5.1	33	31	5,006	-10.1	36	30	4,899	-15.7	54	31	5,011	-10.5	45	29	4,907	-15.8	53	31	5,083	-6.4	
500	31	5,781	-12.5		31	5,840	-10.1		31	5,734	-14.9	36	30	5,605	-20.6	52	31	5,734	-15.5	41	29	5,615	-21.0	48	31	5,820	-11.0	
450	31	6,581	-18.2		31	6,645	-15.6		31	6,525	-20.4	34	30	6,380	-26.4	48	31	6,527	-20.7	35	29	6,389	-26.5	45	31	6,625	-16.5	
400	31	7,446	-24.5		31	7,523	-21.9		31	7,383	-27.1		30	7,217	-32.6	45	31	7,382	-26.9	33	28	7,234	-32.4		31	7,497	-22.6	
350	30	8,404	-32.0		31	8,491	-29.0		31	8,330	-34.4		30	8,143	-39.7		31	8,331	-34.1		28	8,162	-39.5		31	8,463	-29.7	
300	30	9,474	-40.1		31	9,575	-36.8		31	9,391	-42.2		30	9,179	-47.2		30	9,398	-41.6		28	9,199	-47.1		30	9,546	-37.4	
250	30	10,694	-49.1		31	10,812	-46.3		31	10,600	-50.5		29	10,357	-53.6		30	10,610	-50.1		27	10,379	-54.2		28	10,784	-46.5	
200	30	12,129	-57.3		29	12,259	-56.5		28	12,031	-56.9		28	11,789	-56.4		29	12,052	-56.9		26	11,803	-56.9		28	12,232	-56.0	
175	30	12,966	-60.3		27	13,092	-61.1		27	12,865	-58.4		28	12,635	-56.8		29	12,891	-59.7		25	12,647	-56.8		28	13,073	-59.5	
150	30	13,922	-62.0		27	14,039	-65.4		25	13,841	-60.0		27	13,603	-56.2		29	13,852	-60.4		23	13,619	-56.4		28	14,030	-62.5	
125	28	15,043	-63.7		26	15,141	-68.5		25	14,973	-61.6		27	14,761	-56.4		29	14,983	-62.0		23	14,774	-57.1		28	15,144	-66.0	
100	27	16,400	-64.5		24	16,465	-70.7		25	16,351	-62.4		27	16,176	-56.6		28	16,360	-63.2		22	16,194	-57.3		26	16,500	-67.0	
80	26	17,770	-62.6		20	17,797	-67.9		23	17,723	-61.7		27	17,590	-56.6		26	17,746	-62.5		21	17,599	-57.4		23	17,845	-65.4	
60	25	19,558	-59.8		19	19,557	-61.4		21	19,522	-59.9		24	19,415	-56.9		20	19,530	-59.9		17	19,408	-57.3		17	19,617	-62.7	
50	24	20,698	-58.3		19	20,692	-59.3		19	20,651	-58.8		23	20,575	-57.2		11	20,701	-58.5		10	20,604	-57.9		6	20,737	-61.6	
40	24	22,104	-57.2		17	22,102	-56.7		19	22,056	-57.2		22	21,992	-57.1		6	22,138	-57.3		7	22,041	-57.5					
30	23	23,934	-55.4		16	23,947	-54.0		15	23,893	-55.5		16	23,862	-56.2													
20	15	26,539	-52.9		8	26,570	-50.9						8	26,511	-54.7													
15	8	28,381	-52.0										7	28,346	-53.7													

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

OCTOBER 1951

Standard pressure surface (mb.)	HATTERAS, N. C. (1017 MB.)				HAVANA, CUBA (1008 MB.)				HILO, T. H. (1013 MB.)				INTERNAT. FALLS, MINN. (974 MB.)				JOLIET, ILL. (996 MB.)				LAKE CHARLES, LA. (1017 MB.)				LANDER, WYO. (829 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	19.6	88	31	49	24.7	87	31	9	25.2	76	31	361	5.0	82	31	179	10.8	83	31	5	20.0	85	31	1,696	6.9	56
1,000	31	148	19.1	83	31	119	25.1	83	31	123	24.2	76	31	145			31	148			31	154	22.2	71	31	120		
950	31	597	16.9	76	31	578	22.9	79	31	579	20.9	79	31	565	5.5	77	31	582	12.9	67	31	602	19.9	67	31	561		
900	31	1,049	14.7	66	31	1,040	20.1	78	31	1,037	17.9	80	31	1,006	3.3	75	31	1,032	10.6	63	31	1,064	17.1	64	31	1,017		
850	31	1,530	12.4	63	31	1,532	17.4	77	31	1,525	14.9	80	31	1,468	1.3	71	31	1,507	8.6	58	31	1,551	14.6	56	31	1,489		
800	31	2,037	10.2	60	31	2,049	15.0	70	31	2,037	12.9	71	31	1,955	- 0.6	65	31	2,007	6.6	52	31	2,062	12.9	42	31	1,991	7.6	48
750	31	2,581	7.6	53	31	2,602	12.7	59	31	2,588	11.9	44	31	2,474	- 2.6	56	31	2,543	4.1	49	31	2,607	10.1	37	31	2,526	4.4	47
700	31	3,138	5.1	43	31	3,172	9.9	53	31	3,154	9.2	39	31	3,014	- 5.1	49	31	3,093	1.4	46	31	3,173	7.3	33	31	3,078	0.4	50
650	31	3,743	1.9	38	31	3,792	6.3	50	31	3,769	5.9		31	3,598	- 7.9	46	31	3,694	- 2.0	44	31	3,785	4.1		31	3,672	- 3.9	50
600	31	4,381	- 1.8	38	31	4,437	2.4	48	30	4,417	2.4		31	4,211	-11.4	45	31	4,318	- 5.8	40	31	4,425	0.3		31	4,294	- 8.1	51
550	31	5,069	- 5.5		31	5,141	- 1.5	46	30	5,114	- 1.4	36	31	4,878	-15.4	46	31	5,002	- 9.5	36	31	5,119	- 4.1		31	4,970	-12.5	44
500	31	5,809	-10.1		31	5,889	- 5.8	43	30	5,868	- 5.8		31	5,587	-20.0	48	31	5,726	-14.2	35	30	5,863	- 8.8		31	5,685	-17.8	42
450	31	6,620	-15.7		31	6,717	-11.1	41	30	6,692	-11.1		30	6,364	-25.6	48	31	6,523	-19.9		29	6,681	-14.1	33	30	6,472	-23.3	40
400	31	7,491	-22.1	33	30	7,602	-17.0	39	30	7,580	-17.2		30	7,203	-31.9	49	31	7,380	-26.3		29	7,556	-20.5	32	29	7,322	-29.3	41
350	31	8,459	-28.9		30	8,590	-24.1	38	30	8,567	-24.2		30	8,133	-38.9		31	8,330	-33.7		29	8,528	-27.9		29	8,261	-36.4	
300	31	9,543	-37.1		30	9,696	-32.6	38	30	9,672	-32.6		30	9,173	-46.8		31	9,392	-41.8		29	9,616	-36.1		28	9,316	-44.3	
250	30	10,783	-46.4		30	10,954	-42.8		30	10,930	-42.7		30	10,360	-54.5		29	10,608	-50.5		28	10,852	-45.7		28	10,514	-52.4	
200	30	12,229	-56.6		30	12,421	-54.8		30	12,396	-54.9		30	11,773	-58.0		29	12,034	-58.2		28	12,304	-56.0		28	11,936	-57.7	
175	29	13,070	-60.6		30	13,262	-60.9		30	13,235	-61.4		30	12,615	-57.4		28	12,872	-60.5		28	13,143	-60.9		26	12,778	-58.8	
150	28	14,015	-64.3		30	14,204	-67.6		29	14,177	-67.5		30	13,590	-57.1		27	13,826	-61.4		27	14,089	-65.5		25	13,744	-58.7	
125	28	15,119	-67.6		30	15,284	-73.8		15	15,270	-71.8		29	14,738	-57.2		27	14,952	-62.3		25	15,181	-69.6		21	14,892	-59.2	
100	27	16,457	-67.9		27	16,572	-76.2		11	16,568	-74.7		28	16,154	-56.9		24	16,314	-62.3		24	16,501	-71.4		20	16,282	-59.7	
80	26	17,801	-66.1		26	17,866	-73.0		6	17,893	-72.5		22	17,556	-57.1		20	17,686	-61.2		24	17,824	-69.1		18	17,658	-59.7	
60	17	19,556	-63.3		20	19,579	-66.0		5	19,609	-65.8		18	19,382	-57.2		11	19,475	-58.8		22	19,566	-63.7		13	19,466	-60.2	
50	11	20,683	-62.1		17	20,694	-61.9						15	20,508	-57.7		5	20,653	-57.3		21	20,687	-61.0		11	20,601	-59.1	
40					6	22,051	-58.8						6	21,881	-57.8						20	22,079	-57.7		10	22,005	-57.3	
30																					18	23,910	-53.8		8	23,835	-56.3	
20																					12	26,534	-50.9					
15																					6	28,394	-49.4					

	LAS VEGAS, NEV. (936 MB.)				LITTLE ROCK, ARK. (1009 MB.)				MAZATLAN, MEXICO (1008 MB.)				MEDFORD, ORE. (971 MB.)				MERIDA, MEXICO (1011 MB.)				MIAMI, FLA. (1015 MB.)				NANTUCKET, MASS. (1018 MB.)			
SURFACE	31	660	18.9	27	31	79	15.7	82	29	14	29.1	75	31	401	11.6	79	31	27	25.9	79	30	4	24.7		31	14	11.8	88
1,000	31	89			31	154	18.0	69	29	84	28.6	73	31	149			31	124	25.5	78	30	133	24.7	80	31	167	13.1	80
950	31	539			31	596	17.3	66	29	548	25.9	69	31	587	13.5	66	31	579	23.1	78	30	585	21.9	81	31	601	11.2	70
900	31	1,004	20.8	20	31	1,055	14.8	63	29	1,016	23.7	64	31	1,035	11.7	59	31	1,046	20.3	77	30	1,051	19.2	74	31	1,047	9.1	63
850	31	1,494	17.2	23	31	1,538	13.2	51	29	1,514	20.7	62	31	1,510	8.9	59	31	1,538	17.3	75	30	1,541	16.7	68	31	1,520	7.9	58
800	31	2,007	13.4	26	31	2,046	11.2	43	29	2,037	17.7	54	31	2,009	5.7	59	31	2,054	14.7	67	30	2,056	14.1	64	31	2,019	6.6	46
750	31	2,548	9.2	28	31	2,585	8.5	37	29	2,591	14.2	48	31	2,544	2.8	54	31	2,602	12.5	59	30	2,602	11.5	56	31	2,552	5.0	38
700	31	3,114	5.7	28	31	3,149	5.5	32	29	3,165	10.3	51	31	3,090	- 0.2	50	31	3,175	9.8	56	30	3,172	8.6	52	31	3,108	2.3	39
650	31	3,718	2.0	27	31	3,755	2.1		29	3,782	6.0	54	31	3,689	- 3.3	45	31	3,793	6.6	47	30	3,785	5.3	50	31	3,709	- 0.9	38
600	31	4,357	- 2.2		31	4,392	- 2.0		29	4,429	1.9	55	31	4,308	- 7.3	42	31	4,441	3.0	46	30	4,432	1.6	48	31	4,337	- 4.7	37
550	31	5,043	- 6.8		30	5,080	- 6.4		29	5,129	- 2.3	50	31	4,986	-11.4	38	31	5,142	- 1.0	44	30	5,129	- 2.3	44	30	5,022	- 8.6	
500	31	5,779	-11.9		30	5,817	-11.2		29	5,877	- 6.4	41	31	5,706	-16.0	35	31	5,896	- 5.4	42	30	5,879	- 7.0	43	28	5,749	-13.3	
450	31	6,581	-17.5		30	6,624	-16.6		29	6,696	-11.5	40	30	6,500	-21.3	36	31	6,724	-10.5		30	6,697	-12.1	43	28	6,550	-18.7	
400	31	7,449	-24.0		29	7,492	-22.8		29	7,586	-17.0		30	7,353	-27.4		31	7,613	-16.2		30	7,584	-18.1	40	28	7,410	-25.2	
350	31	8,409	-31.4		29	8,461	-29.8		28	8,576	-24.2		30	8,300	-34.4		30	8,603	-23.5		30	8,568	-25.2	37	28	8,365	-32.1	
300	31	9,482	-39.8		28	9,538	-38.2		26	9,677	-32.7		30	9,360	-42.5		30	9,711	-31.9		30	9,668	-33.7		27	9,434	-40.1	
250	31	10,704	-48.8		27	10,768	-47.4		26	10,936	-42.3		30	10,568	-50.7		29	10,972	-41.6		30	10,920	-43.9		27	10,653	-49.5	
200	31	12,145	-56.3		27	12,212	-56.4		22	12,397	-53.8		30	11,996	-58.3		28	12,445	-53.9		30	12,378	-56.0		27	12,083	-58.4	
175	31	12,987	-59.0		27	13,051	-60.3		18	13,251	-60.2		29	12,832	-59.9		27	13,290	-60.7		30	13,214	-62.3		27	12,916	-60.9	
150	31	13,946	-61.8		26	14,005	-63.3		15	14,201	-66.5		28	13,796	-60.7		26	14,233	-67.5		29	14,149	-68.4		27	13,869	-62.5	
125	30	15,068	-64.7		23	15,121	-66.7		11	15,273	-72.6		27	14,927	-61.1		25	15,306	-74.2		26	15,234	-73.3		26	14,988	-63.8	
100	28	16,433	-65.7		19	16,464	-67.4		7	16,553	-76.3		26	16,313	-61.6		21	16,582	-78.3		21	16,535	-74.8		24	16,348	-63.6	
80	28	17,789	-64.6		17	17,807	-65.1		5	17,851	-72.1		26	17,697	-60.3		12	17,843	-76.6		17	17,842	-71.6		19	17,730	-62.4	
60	22	19,553	-61.7		16	19,575	-61.0						21	19,503	-60.2		10	19,520	-67.4		14	19,584	-65.5		12	19,544	-60.7	
50	19	20,682	-59.4		12	20,707	-59.0						20	20,639	-59.0		8	20,628	-63.3		12	20,703	-61.1					
40	19	22,085	-57.2		11	22,093	-57.4						17	22,044	-57.6		7	22,016	-59.8		11	22,108	-56.1					
30	16	23,906	-55.2		10	23,932	-54.9						13	23,877	-56.0						8	23,964	-51.4					
20	8	26,469	-53.1										7	26,517	-53.7						5	26,553	-49.8					

	NASHVILLE, TENN. (998 MB.)				NORTH PLATTE, NEBR. (918 MB.)				OAKLAND, CALIF. (1015 MB.)				OKLAHOMA CITY, OKLA. (971 MB.)				OMAHA, NEBR. (981 MB.)				PHOENIX, ARIZ. (972 MB.)				PITTSBURGH, PA. (975 MB.)			
SURFACE	31	177	15.6	77	31	849	7.6	80	31	6	16.4	68	31	391	16.4	71	31	308	11.3	76	31	338	21.9	46	31	382	12.9	67
1,000	31	162			31	127			31	136	16.9	64	31	135			31	143			31	89			31	169		
950	31	602	17.1	61	31	561			31	579	16.2	51	31	577	16.9	63	31	576	11.6	67	31	547	26.4	23	31	606	13.8	59
900	31	1,060	14.2	61	31	1,009	10.5	64	31	1,032	14.4	44	31	1,036	16.2	58	31	1,026	9.9	67	31	1,015	23.1	24	31	1,058	11.4	56
850	31	1,541	12.1	53	31	1,485	9.8	54	31	1,513	12.2	38	31	1,521	14.6	57	31	1,500	8.6	63	31	1,509	19.0	27	31	1,533	8.9	52
800	31	2,048	10.3	37	31	1,987	7.9	47	31	2,019	9.9	32	31	2,032	12.4	51	31	2,000	6.8	61	31	2,025	14.8	31	31	2,033	6.8	45
750	31	2,586	7.8	33	31	2,523	5.2	45	31	2,562	7.4		31	2,576	9.3	46	31	2,535	4.6	49	31	2,572	10.7	35	31	2,567	4.4	39
700	31	3,147	4.5	34	31	3,077	2.1	47	31	3,117	4.2		30	3,140	6.0	44	31	3,089	2.1	42	31	3,137	6.7	31	31	3,119	1.5	37
650	30	3,748	0.7	35	31	3,678	- 1.5	47	31	3,722	0.3	29	29	3,746	2.1	45	31	3,689	- 1.1	42	31	3,744	3.2	29	31	3,717	- 1.6	35
600	30	4,385	- 3.0	31	31	4,305	- 5.7	43	31	4,352	- 3.7	28	29	4,384	- 1.9	42	30	4,321	- 5.2	40	31	4,384	- 1.0		31	4,346	- 5.4	
550	30	5,071	- 7.0		31	4,986	-10.4	39	31	5,034	- 8.0		29	5,073	- 6.1	38	30	5,004	- 9.6	36	31	5,075	- 5.7		31	5,025	- 9.3	
500	30	5,805	-11.5		31	5,707	-15.5	37	29	5,770	-13.0		29	5,810	-10.9		30	5,730	-14.7	37	31	5,811	-10.6		31	5,754	-13.7	
450	29	6,609	-17.2		31	6,499	-21.2	36	29	6,572	-18.4		28	6,614	-16.7		30	6,527	-19.9		31	6,617	-16.3		31	6,553	-18.9	
400	29	7,475	-23.4		31	7,352	-27.6	36	29	7,435	-24.5		28	7,486	-23.3		30	7,384	-26.3		31	7,487	-22.9		31	7,413	-25.7	
350	29	8,438	-30.5		31	8,298	-34.6		29	8,393	-32.0		28	8,448	-30.5		30	8,335	-33.9		31	8,451	-30.2		31	8,366	-32.5	
300	28	9,524	-38.5		31	9,357	-42.5		29	9,463	-40.3		28	9,525	-39.1		30	9,397	-42.3		31	9,529	-38.4		31	9,434	-40.5	
250	28	10,755	-46.9		31	10,566	-50.6		29	10,681	-49.6		27	10,750	-48.1		29	10,615	-50.9		30	10,760	-47.4		30	10,650	-48.5	
200	28	12,203	-56.0		31	11,996	-57.6		27	12,117	-58.0		27	12,192	-56.5		28	12,038	-58.7		29	12,208	-55.5		30	12,090	-56.4	
175	27	13,042	-59.6		31	12,834	-59.5		27	12,952	-60.5		27	13,030	-60.3		28	12,872	-60.5		27	13,052	-59.6		28	12,934	-59.5	
150	27	13,998	-62.8		30	13,795	-60.3		27	13,908	-62.2		26	13,983	-63.5		24	13,833	-61.0		26	14,007	-64.0		27	13,890	-60.9	
125	26	15,117	-65.4		29	14,930	-61.2		26	15,029	-64.0		24	15,099	-65.7		22	14,974	-61.9		25	15,108	-66.8		27	15,019	-62.6	
100	22	16,479	-66.3		27	16,321	-62.8		24	16,392	-65.1		20	16,447	-66.6		16	16,383	-62.4		25	16,450	-68.1		26	16,395	-63.3	
80	20	17,817	-65.0		22	17,714	-61.5		22	17,746	-63.6		15	17,816	-64.9		11	17,765	-61.0		20	17,799	-65.5		24	17,768	-61.7	
60	17	19,587	-61.5		18	19,514	-59.6		21	19,523	-60.6		14	19,593	-60.1		10	19,551	-59.6		18	19,558	-61.1		15	19,562	-59.9	
50	14	20,725	-59.0		13	20,652	-58.6		20	20,663	-58.8		13	20,740	-58.9		10	20,693	-58.3		18	20,698	-58.2		5	20,698	-58.9	
40	12	22,139	-56.6		10	22,062	-57.7		20	22,068	-57.0		13	22,142	-57.6		8	22,107	-57.5		18	22,109	-56.1					
30	8	23,987	-54.1		7	23,928	-55.5		16	23,888	-54.7		10	23,979	-54.9		6	23,942	-54.7		14	23,941	-54.5					
20	6	26,599	-51.8		7	26,518	-54.2		9	26,459	-53.4		7	26,547	-53.0						9	26,557	-51.5					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

OCTOBER 1951

Standard pressure surface (mb.)	PORTLAND, MAINE (1018 MB.)				RAPID CITY, S. DAK. (905 MB.)				ST. CLOUD, MINN. (979 MB.)				SAN ANTONIO, TEX. (989 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	20	7.8	87	31	966	6.7	74	31	317	7.1	83	30	240	22.2	63
1,000	30	172	10.2	78	31	131			31	137			30	145		
950	30	602	9.0	71	31	565			31	569	8.0	74	30	591	21.6	65
900	30	1,044	7.3	67	31	1,013			31	1,008	6.5	69	30	1,060	19.1	66
850	30	1,514	6.1	56	31	1,487	7.9	60	31	1,476	5.0	58	30	1,550	16.2	66
800	30	2,010	4.8	49	31	1,984	5.4	59	31	1,969	3.5	53	30	2,064	14.3	51
750	30	2,539	2.9	46	31	2,518	2.8	58	31	2,500	1.4	49	30	2,611	11.9	41
700	30	3,090	0.5	43	31	3,065	-0.4	56	31	3,044	-1.6	50	30	3,181	8.4	40
650	30	3,689	-2.0	39	31	3,660	-3.7	56	31	3,636	-5.2	48	30	3,792	4.9	39
600	30	4,314	-5.8		31	4,282	-7.6	54	31	4,255	-8.9	45	30	4,438	0.8	39
550	30	4,996	-9.9		31	4,959	-12.1	52	31	4,932	-13.0	42	30	5,133	-3.1	
500	30	5,719	-14.5		31	5,676	-17.1	48	31	5,643	-17.8	41	29	5,880	-8.0	
450	30	6,515	-20.0		31	6,462	-22.7	47	31	6,431	-22.8	36	29	6,699	-13.3	
400	30	7,371	-26.6		29	7,311	-29.1	44	31	7,278	-28.6	36	29	7,578	-19.4	
350	30	8,322	-33.4		27	8,245	-36.8		31	8,220	-36.0	37	29	8,556	-26.7	
300	28	9,386	-41.2		27	9,293	-44.8		31	9,273	-44.0		28	9,645	-35.3	
250	27	10,606	-50.5		25	10,500	-52.6		31	10,473	-52.4		28	10,890	-44.8	
200	24	12,030	-58.5		24	11,927	-56.1		31	11,896	-57.7		28	12,346	-55.4	
175	24	12,866	-59.9		23	12,773	-56.9		31	12,736	-58.6		28	13,187	-60.5	
150	24	13,823	-61.4		23	13,745	-57.7		30	13,699	-58.3		28	14,136	-65.2	
125	22	14,956	-62.1		20	14,888	-58.2		30	14,846	-58.0		26	15,234	-69.8	
100	20	16,348	-63.1		20	16,289	-58.5		27	16,250	-58.0		24	16,555	-71.3	
80	17	17,715	-61.4		19	17,694	-58.6		21	17,659	-57.9		21	17,882	-68.6	
60	6	19,565	-60.7		17	19,492	-57.5		16	19,480	-57.1		20	19,624	-63.1	
50					17	20,641	-57.5		10	20,613	-57.8		18	20,751	-60.4	
40					16	22,050	-56.0		5	21,966	-57.3		17	22,149	-57.6	
30					8	23,948	-54.0						17	23,976	-54.6	
20													8	26,572	-51.2	

Standard pressure surface (mb.)	SAN JUAN, P. R. (1012 MB.)				SANTA MARIA, CALIF. (1007 MB.)				S. STE. MARIE, MICH. (991 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	19	25.5	87	31	71	13.9	81	31	221	6.4	89
1,000	31	127	25.8	81	31	128	15.1	74	31	144		
950	31	590	23.6	78	31	574	17.9	44	31	572	6.0	78
900	31	1,050	20.6	78	31	1,027	16.6	38	31	1,009	4.4	76
850	31	1,542	17.7	77	31	1,511	13.8	36	31	1,473	3.5	68
800	31	2,060	15.0	75	31	2,019	11.2	32	31	1,964	1.6	64
750	31	2,608	12.3	69	31	2,560	8.8	24	31	2,487		56
700	31	3,182	9.5	58	31	3,123	5.9		31	3,032	-2.6	52
650	31	3,800	6.4	47	31	3,732	2.5		31	3,624	-5.4	49
600	31	4,446	2.9	39	31	4,367	-1.7		31	4,242	-8.5	51
550	31	5,152	-1.1	34	31	5,056	-6.4		31	4,915	-12.3	46
500	30	5,901	-5.7	31	31	5,792	-11.7		31	5,634	-17.1	44
450	29	6,727	-10.8		31	6,596	-17.2		29	6,419	-22.4	40
400	29	7,614	-16.9		31	7,463	-23.6		29	7,271	-28.4	40
350	29	8,601	-24.1		31	8,424	-31.2		29	8,214	-35.8	
300	29	9,706	-32.7		31	9,496	-39.7		29	9,267	-43.9	
250	28	10,963	-43.0		30	10,716	-49.0		28	10,480	-52.5	
200	28	12,429	-54.8		30	12,153	-57.1		28	11,900	-58.1	
175	28	13,270	-61.2		30	12,990	-60.6		25	12,754	-59.2	
150	28	14,212	-67.8		30	13,943	-63.2		25	13,720	-58.5	
125	28	15,293	-73.1		30	15,055	-66.0		25	14,863	-59.2	
100	26	16,592	-75.5		29	16,404	-67.0		25	16,259	-59.4	
80	23	17,891	-73.5		28	17,753	-64.4		22	17,654	-59.1	
60	20	19,600	-66.6		27	19,526	-61.7		14	19,476	-58.2	
50	15	20,727	-62.1		22	20,659	-59.5		9	20,655	-57.7	
40	6	22,134	-57.7		20	22,060	-57.0					
30					10	23,860	-55.3					
20												

Standard pressure surface (mb.)	SPOKANE, WASH. (932 MB.)				SWAN ISLAND, W. I. (1011 MB.)				TACUBAYA, MEXICO (774 MB.)				TAMPA, FLA. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	722	8.1	78	31	10	26.8	83	31	2,306	16.2	61	31	9	22.7	84
1,000	31	135			31	110	27.1	80	31	66			31	142	22.9	80
950	31	566			31	573	24.1	80	31	528			31	591	20.8	74
900	31	1,012	8.1	67	31	1,035	21.2	78	31	1,006			31	1,055	18.2	71
850	31	1,481	5.4	65	31	1,529	18.3	75	31	1,500			31	1,544	15.6	66
800	31	1,974	2.5	63	31	2,047	15.5	73	31	2,034			31	2,057	13.1	56
750	31	2,496	-0.6	62	31	2,596	12.6	70	31	2,583	14.2	61	31	2,602	10.4	49
700	31	3,041	-3.7	54	31	3,171	9.7	64	31	3,157	10.1	66	31	3,169	7.6	46
650	31	3,626	-7.2	51	31	3,787	6.7	57	31	3,775	5.8	70	31	3,785	4.8	37
600	31	4,242	-11.1	50	31	4,437	3.1	54	31	4,421	1.5	72	31	4,425	1.4	34
550	31	4,910	-15.3	48	31	5,142	-1.0	45	30	5,122	-2.4	64	31	5,125	-2.6	32
500	31	5,618	-20.5	49	31	5,892	-5.4	41	30	5,869	-6.0	48	31	5,869	-7.2	
450	31	6,393	-25.7	46	31	6,716	-10.2	39	30	6,695	-10.8	37	31	6,690	-12.2	31
400	31	7,233	-31.9	46	31	7,611	-15.6	39	30	7,584	-16.8	36	31	7,574	-18.0	
350	31	8,161	-39.0		31	8,604	-22.6	37	30	8,573	-24.1		31	8,556	-25.6	
300	31	9,201	-46.3		31	9,716	-31.0	32	28	9,679	-32.4		30	9,655	-33.4	
250	31	10,394	-52.3		31	10,981	-41.1		27	10,939	-42.4		30	10,909	-42.9	
200	29	11,813	-55.8		31	12,457	-53.5		21	12,424	-54.2		30	12,376	-54.3	
175	28	12,667	-56.2		31	13,302	-60.2		13	13,260	-61.0		30	13,220	-59.8	
150	28	13,647	-55.7		30	14,248	-67.2		8	14,194	-68.1		28	14,169	-65.3	
125	28	14,805	-56.2		28	15,328	-74.2		6	15,262	-75.6		24	15,259	-70.2	
100	28	16,222	-56.4		23	16,614	-78.2		5	16,539	-78.7		21	16,574	-71.9	
80	27	17,643	-55.9		19	17,896	-75.6						20	17,893	-69.9	
60	24	19,483	-56.2		14	19,575	-68.4						16	19,628	-65.5	
50	21	20,634	-55.8		14	20,680	-63.8						15	20,750	-61.6	
40	18	22,058	-55.5		13	22,065	-59.9						13	22,142	-57.6	
30	12	23,868	-54.8		13	23,876	-56.2						12	23,967	-53.4	
20					11	26,498	-51.0						7	26,599	-50.2	
15					8	28,367	-50.2						5	28,436	-48.8	

Standard pressure surface (mb.)	TATOOSH ISLAND, WASH. (1012 MB.)				TOLEDO, OHIO (996 MB.)				WASHINGTON, D. C. (1011 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	31	10.8	87	31	191	11.9	78	31	88	14.2	78
1,000	31	127			31	155			31	177	15.3	73
950	31	559	9.0	77	31	588	13.5	61	31	615	14.2	67
900	31	1,000	6.5	75	31	1,042	10.6	62	31	1,067	12.1	66
850	31	1,467	3.9	72	31	1,516	8.3	56	31	1,545	9.9	63
800	31	1,958	1.4	60	31	2,015	6.2	49	31	2,047	7.7	55
750	31	2,481	-1.0	61	31	2,550	4.0	42	31	2,584	5.9	44
700	31	3,023	-3.8	56	31	3,100	1.5	37	31	3,140	3.4	35
650	31	3,608	-7.1	51	31	3,700	-1.8	37	31	3,744	-0.1	33
600	31	4,224	-10.9	46	31	4,326	-5.8	37	31	4,374	-3.8	
550	31	4,887	-15.0	43	31	5,008	-9.8	36	31	5,059	-7.8	
500	31	5,601	-19.6	44	31	5,732	-14.4	29	31	5,790	-12.5	
450	31	6,374	-25.0	42	31	6,530	-19.9		31	6,589	-17.8	
400	31	7,220	-31.2	41	31	7,385	-26.3		31	7,457	-24.0	
350	31	8,151	-38.3		31	8,335	-33.7		31	8,418	-30.8	
300	30	9,196	-45.9		30	9,407	-41.6		31	9,494	-38.8	
250	30	10,389	-52.7		30	10,619	-50.5		31	10,720	-48.2	
200	29	11,815	-57.5		30	12,048	-58.2		31	12,158	-57.6	
175	29	12,656	-57.7		29	12,881	-60.3		29	13,007	-60.3	
150	29	13,628	-57.7		29	13,838	-61.5		28	13,966	-62.7	
125	28	14,772	-57.9		28	14,956	-62.6		22	15,092	-65.0	
100	27	16,187	-57.3		26	16,326	-63.1		21	16,444	-66.0	
80	20	17,614	-57.6		26	17,700	-61.7		19	17,800	-64.3	
60	10	19,381	-57.3		20	19,498	-60.0		16	19,573	-61.6	
50					7	20,605	-59.0		15	20,708	-60.2	
40									14	22,100	-58.7	
30									13	23,919	-55.9	
20									5	26,523	-52.7	
15												

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	193	2.5	31	244	3.0	25	248	2.1	30	342	2.0	31	242	0.9	31	105	3.8	31	260	2.2	30	208	1.3	31	33	1.4	30	221	1.4	31	246	3.1	31	272	1.0
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	29	101	4.3	31	259	3.3	30	204	3.9	31	31	3.3	30	207	1.9	--	---	----	--	---	----
1,000	28	204	4.2	--	---	----	--	---	----	30	314	2.1	31	324	1.2	24	129	3.0	28	236	5.6	27	213	4.1	30	32	3.8	29	205	2.8	--	---	----	--	---	----
1,500	27	213	4.2	--	---	----	25	248	4.8	25	300	2.6	31	289	1.7	19	172	1.4	23	240	5.9	23	239	4.9	27	18	3.5	26	225	4.0	31	245	3.5	--	---	----
2,000	26	223	4.3	31	250	5.1	22	261	6.9	20	281	4.8	29	267	3.0	18	221	.6	23	256	7.5	18	258	5.8	22	327	4.0	24	260	4.8	31	239	4.1	31	270	1.2
2,500	23	239	4.8	31	251	5.7	20	264	8.4	17	292	5.8	26	271	4.8	15	300	1.1	22	266	8.2	17	267	6.9	22	317	4.0	23	260	5.4	31	237	4.3	31	267	1.7
3,000	23	250	5.9	30	265	6.0	19	282	9.0	17	287	7.3	23	284	5.8	15	327	2.6	22	264	9.0	14	271	7.4	22	313	4.4	21	273	6.7	31	243	6.2	30	248	3.0
4,000	22	266	7.9	30	263	9.9	15	283	9.4	15	282	10.0	19	291	9.1	11	327	3.5	21	263	11.8	12	270	10.7	19	305	6.4	18	270	7.1	28	258	8.2	28	263	4.8
5,000	21	268	7.3	26	268	12.2	12	290	10.8	13	295	11.3	13	290	9.3	10	306	3.4	14	259	11.9	12	269	13.8	17	295	5.4	13	269	8.2	24	264	10.0	26	275	9.5
6,000	19	276	9.8	23	267	16.1	11	300	12.0	12	286	10.9	13	300	11.2				13	266	13.9	10	261	15.1	14	285	8.7	10	262	8.2	24	269	10.0	25	279	11.9
8,000	10	286	12.4	19	267	18.7																			12	276	12.1				21	262	14.9	22	289	15.5
10,000				16	279	19.6																			10	262	21.3				15	264	22.3	19	289	19.5
12,000				14	279	25.1																			10	252	27.6				12	276	26.4	15	284	21.7
14,000				12	272	22.8																												13	275	24.9

	Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)		
Surface	31	306	2.4	29	28	2.3	28	276	1.7	29	37	3.5	29	206	2.5	16	131	0.6	27	176	1.0	31	300	0.5	31	76	2.8	31	36	1.6	28	281	0.2	31	257	3.1
500	--	---	----	29	19	2.5	--	---	----	26	27	3.0	29	211	4.5	--	---	----	27	185	1.2	31	291	.7	31	74	3.1	31	38	1.4	28	196	.6	31	300	2.9
1,000	--	---	----	29	17	2.3	28	267	3.2	21	336	2.3	26	215	6.3	16	150	1.2	26	228	2.3	31	245	1.2	29	64	2.0	30	24	1.4	26	192	1.5	29	343	2.2
1,500	31	306	2.4	25	355	2.3	25	255	5.1	17	311	3.9	25	222	7.7	16	217	3.0	23	247	3.2	30	230	3.3	27	38	1.6	25	28	2.5	23	208	2.2	28	339	3.2
2,000	31	286	2.8	23	347	3.4	21	253	6.4	17	319	4.4	25	245	9.2	16	238	4.4	22	257	3.9	25	240	2.0	27	352	.8	18	44	3.4	22	227	3.3	28	330	4.5
2,500	31	261	3.8	23	331	3.2	18	260	8.0	17	321	3.9	22	251	9.4	16	242	5.1	22	273	4.7	23	268	2.6	26	270	.2	16	40	2.4	21	243	3.5	27	343	5.6
3,000	31	245	5.4	22	312	5.0	16	270	9.3	16	318	4.1	19	261	8.5	16	253	6.5	21	284	5.3	20	298	3.0	26	286	1.0	12	345	1.6	20	248	3.9	27	340	7.1
4,000	30	250	8.2	18	295	5.5	13	281	11.5	14	310	5.6	16	269	7.8	16	262	8.7	21	281	7.3	18	318	6.5	26	277	2.9	10	320	3.6	20	255	4.6	26	332	7.9
5,000	27	270	10.4	17	265	9.7				13	291	5.8	13	284	7.5	15	268	12.1	20	278	6.9	15	328	8.9	23	265	4.3	10	284	6.1	18	281	5.0	26	319	9.6
6,000	24	274	14.7	14	280	10.3				13	286	8.1				14	275	14.8	15	280	7.3	12	321	12.4	20	288	4.1				17	274	5.5	25	312	11.9
8,000	19	267	22.7	10	280	12.6										13	284	17.8				10	309	16.2	15	292	6.1				15	277	7.5	13	320	15.6
10,000																13	291	20.8							11	304	9.2				13	281	10.7			
12,000																11	291	24.5																		

	Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S.Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
Surface	29	191	3.5	30	263	0.3	31	188	0.5	29	10	2.3	27	207	0.3	26	187	2.2	30	130	3.2	31	255	2.8	28	290	0.5	27	224	2.7	30	224	2.1	31	18	0.4
500	29	194	3.8	30	243	.5	31	211	.8	--	---	----	27	204	.8	26	206	2.7	30	141	3.4	31	275	2.4	28	233	2.0	27	224	4.2	--	---	----	31	323	.2
1,000	29	201	4.7	27	241	1.2	30	220	1.3	29	9	2.4	25	218	2.1	25	209	3.2	30	159	3.4	28	266	.9	21	220	5.1	22	208	3.5	30	226	3.5	27	270	1.8
1,500	27	214	7.3	24	236	4.3	30	209	1.9	28	358	2.0	21	240	6.1	24	227	4.2	29	163	2.9	28	135	.7	16	237	5.7	20	228	4.0	28	224	5.3	24	283	2.8
2,000	25	232	8.2	23	244	7.2	29	209	3.3	21	271	3.8	19	269	6.9	24	251	6.3	28	192	2.1	25	105	1.4	12	240	5.3	19	237	4.3	20	232	5.9	21	309	4.6
2,500	24	241	8.7	22	258	8.5	29	230	4.9	20	267	6.6	18	272	8.3	23	252	8.3	26	182	1.2	25	156	1.0	10	242	7.1	17	261	5.2	14	233	5.1	20	298	6.1
3,000	21	260	10.5	21	269	9.1	28	240	6.6	19	268	8.2	18	271	10.3	22	252	8.4	25	261	1.3	25	227	2.7				15	283	6.2	11	244	5.4	20	292	5.7
4,000	17	282	11.0	19	267	10.0	26	246	8.5	17	271	9.9	14	278	9.8	19	265	9.4	23	310	3.0	25	257	4.5				11	289	8.7	10	268	6.2	18	283	7.8
5,000	17	284	12.3	15	290	10.9	25	258	10.2	16	264	12.6	14	286	12.9	17	271	10.5	20	302	5.5	23	251	5.6				11	291	12.1				18	271	10.2
6,000	17	286	12.3	15	284	11.8	21	268	10.6	10	294	13.8	13	289	15.6	15	271	13.2	15	293	5.9	22	252	7.1				10	311	10.6				15	267	9.7
8,000	11	297	16.5	13	280	14.0	17	274	16.0							10	270	13.7	11	284	14.0	18	251	7.6										12	269	12.3
10,000																						13	246	15.3												

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	139	0.9	31	159	5.3	31	38	1.4	31	112	1.5
500	--	---	----	--	---	----	--	---	----	30	114	5.2
1,000	--	---	----	31	175	7.7	31	349	.7	30	113	4.0
1,500	--	---	----	31	197	6.7	30	275	2.5	31	102	2.5
2,000	31	264	3.5	31	223	5.4	30	282	4.5	31	71	1.3
2,500	31	262	5.3	30	243	5.8	30	281	5.8	31	79	1.0
3,000	31	260	6.7	30	254	6.9	30	281	7.3	30	120	.5
4,000	31	255	8.9	28	264	8.8	29	269	10.1	30	319	1.4
5,000	31	264	11.6	28	264	10.0	29	269	12.0	30	272	1.8
6,000	31	267	13.8	27	271	10.4	27	267	12.9	30	276	3.4
8,000	20	273	13.5	24	265	16.1	27	260	17.5	31	269	7.3
10,000	16	289	15.0	23	265	21.6	25	261	21.1	30	266	11.8
12,000	14	292	19.6	16	272	22.3	19	269	17.5	26	269	14.0
14,000	11	295	21.0	10	282	20.1	16	271	14.8	25	264	12.9
16,000							14	272	13.3	21	249	8.1
18,000							11	276	8.3	13	216	2.4
20,000										11	92	6.1

Altitude (meters) m.s.l.	Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	55	3.0	31	225	1.0	31	33	1.8	31	160	1.2
500	29	68	4.9	31	254	3.6	30	57	4.8	31	188	4.0
1,000	29	67	5.9	31	269	4.6	30	57	5.0	31	215	5.1
1,500	28	74	5.1	31	268	6.0	31	48	4.0	31	243	5.7
2,000	29	80	3.4	31	270	7.5	31	39	3.2	31	257	6.2
2,500	29	63	1.2	31	269	8.7	31	14	2.1	31	260	7.1
3,000	30	342	1.3	31	268	10.0	31	325	2.3	31	262	8.0
4,000	30	302	3.3	31	261	13.0	30	287	3.7	30	265	10.2
5,000	29	275	4.4	31	261	15.6	30	266	5.9	30	267	11.5
6,000	28	280	6.2	30	263	18.9	30	262	7.4	30	266	12.8
8,000	28	266	9.2	29	261	22.4	28	259	13.2	28	269	16.4
10,000	28	269	14.7	22	263	27.3	26	268	17.2	23	267	20.2
12,000	27	266	21.1	21	265	27.4	24	273	23.0	18	266	21.5
14,000	25	273	19.5	16	281	20.9	21	274	19.8	14	261	23.9
16,000	16	252	13.7	15	269	18.1	20	264	11.7			
18,000				11	273	16.2	20	270	2.6			
20,000							10	129	2.1			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	45	0.7	31	23	1.5	31	12	3.4	31	72	0.6
500	--	---	----	31	37	2.6	28	42	4.9	31	127	.8
1,000	--	---	----	31	33	3.1	28	30	3.3	31	209	2.3
1,500	31	47	.7	31	355	2.5	27	38	1.4	31	250	3.8
2,000	31	240	1.9	31	344	2.3	28	5	1.1	30	269	4.4
2,500	31	234	3.4	31	330	2.6	28	316	1.6	30	273	5.1
3,000	31	233	5.4	31	306	3.5	28	287	1.9	30	276	6.2
4,000	31	240	7.5	31	286	5.4	31	284	3.2	29	277	9.2
5,000	31	256	8.7	29	280	7.9	31	267	6.3	28	274	11.8
6,000	30	267	11.4	29	273	8.7	30	262	8.5	27	267	13.6
8,000	27	269	16.7	27	265	13.9	30	249	13.9	24	270	16.1
10,000	20	269	19.1	21	266	17.2	26	245	14.2	18	263	17.6
12,000	13	295	18.5	20	268	22.7	25	254	18.9	16	257	20.5
14,000	12	291	21.5	16	267	18.2	23	269	18.7	13	267	15.6
16,000				14	272	16.5	21	266	14.3			
18,000				12	277	6.5	15	261	5.9			
20,000												

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	180	0.2	31	252	0.3	31	37	1.3	31	48	1.6
500	29	167	2.2	30	261	.4	31	79	3.9	30	40	1.1
1,000	29	196	2.2	30	280	1.0	31	79	3.8	30	250	1.4
1,500	29	225	3.7	29	247	2.0	31	80	2.0	30	258	3.4
2,000	30	252	3.9	29	250	3.3	31	119	1.3	30	264	5.1
2,500	30	268	4.7	29	269	4.4	31	161	.6	30	264	6.5
3,000	30	268	5.2	31	295	6.6	31	253	1.3	29	258	6.9
4,000	30	292	6.7	30	301	9.2	31	240	2.7	29	261	8.9
5,000	29	294	7.7	29	297	12.5	31	253	4.4	26	264	11.4
6,000	27	281	7.3	25	294	12.8	31	264	6.2	25	264	14.7
8,000	23	278	13.6	22	292	16.4	31	262	6.8	22	267	16.5
10,000	22	273	17.8	12	292	8.0	31	268	10.8	15	264	17.9
12,000	19	267	23.3	10	287	10.5	31	270	10.9	13	270	22.6
14,000	16	267	17.0				29	278	13.7	11	268	23.1
16,000	12	269	13.9				19	305	3.8			
18,000	11	247	8.0				13	71	5.5			
20,000							10	99	7.7			
22,000												

Altitude (meters) m.s.l.	Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	196	0.2	31	280	1.6	30	140	4.0	31	29	1.1
500	31	175	2.4	31	306	3.6	26	141	3.5	--	---	----
1,000	30	192	2.8	31	322	3.7	25	185	5.7	31	30	1.0
1,500	30	225	3.0	31	337	3.6	24	214	7.5	31	267	1.4
2,000	30	249	3.8	31	344	3.3	25	233	7.8	31	270	3.9
2,500	30	266	4.4	31	326	4.1	26	249	7.9	31	272	4.9
3,000	29	272	5.1	31	311	4.1	26	262	8.7	31	275	7.1
4,000	28	266	6.6	31	309	8.2	27	268	9.7	30	271	10.1
5,000	27	274	7.5	31	302	9.9	28	271	11.7	30	269	10.7
6,000	27	264	9.3	28	303	13.3	27	269	12.8	30	273	12.3
8,000	26	273	13.2	21	297	12.7	26	269	13.4	27	268	16.5
10,000	23	271	17.4	14	294	14.3	24	274	17.0	23	271	20.0
12,000	22	271	21.7				19	268	23.0	19	274	18.5
14,000	17	262	23.2				15	266	22.3	13	264	18.3
16,000	12	255	18.1				12	262	14.8	10	274	13.7
18,000												
20,000												
22,000												

Altitude (meters) m.s.l.	San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	118	2.3	31	175	1.4	31	51	0.5	31	304	0.9
500	30	138	6.1	30	99	5.3	31	161	1.2	30	18	4.1
1,000	30	150	5.4	30	101	5.4	31	216	3.2	30	30	4.7
1,500	30	171	2.7	30	99	4.6	30	247	4.5	30	20	4.4
2,000	30	181	1.9	30	91	3.9	30	268	5.9	30	5	3.3
2,500	30	199	.9	30	84	3.4	30	272	7.1	31	343	3.6
3,000	31	253	.9	31	82	3.1	30	280	8.5	31	328	4.2
4,000	31	298	3.1	31	76	2.6	29	274	11.0	30	312	5.1
5,000	31	276	5.6	31	80	2.1	29	269	14.2	30	309	7.1
6,000	29	272	6.6	30	103	1.7	28	268	17.5	29	296	10.4
8,000	29	270	11.7	29	141	1.7	24	259	23.0	25	295	11.0
10,000	28	272	17.8	29	200	2.1	17	265	19.2	25	301	14.6
12,000	25	273	21.0	28	281	2.8	15	268	20.8	23	279	14.9
14,000	15	274	19.4	28	302	5.0	12	267	18.0	23	277	14.3
16,000				26	292	3.7	10	277	12.8	22	276	11.4
18,000				21	72	4.4				21	288	4.7
20,000				16	87	8.5				20	329	4.1
22,000										17	226	.7

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)			Washington, D.C. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	44	1.3	31	180	1.6	30	129	0.9	31	10	0.4
500	29	163	.9	--	---	----	29	207	1.6	31	5	.8
1,000	28	249	3.7	30	217	4.1	29	236	3.4	31	323	2.3
1,500	28	261	6.0	29	237	6.5	29	238	4.4	31	305	3.0
2,000	26	263	5.6	29	243	6.9	29	246	5.0	31	294	3.0
2,500	26	261	6.7	29	254	7.5	30	259	6.0	31	280	4.1
3,000	26	263	7.8	30	263	7.7	30	267	7.3	30	272	4.8
4,000	22	267	10.8	30	274	10.0	29	271	8.5	30	269	5.9
5,000	18	273	12.7	31	272	12.6	28	280	11.6	29	268	8.0
6,000	15	270	13.7	29	283	11.8	27	285	11.9	27	269	7.4
8,000	10	269	20.7	24	272	11.0	21	276	15.3	26	258	12.5
10,000				22	296	13.2	15	272	17.0	23	256	15.2
12,000				20	289	14.9	11	251	16.3	20	261	18.7
14,000				17	292	13.0	10	263	17.7	17	267	20.9
16,000				15	270	10.7				12	264	14.2
18,000				15	281	9.3				10	281	10.7
20,000				14	280	5.1						
22,000				10	282	4.7						

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E= 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three.

See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30.—Solar radiation intensities, tabulated in langleys per minute. OCTOBER 1951

TABLE MOUNTAIN, CALIF.

Date	Sun's zenith distance, A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	Vapor pressure, E.S.T. 7:30 a.m.	Vapor pressure, E.S.T. 1:30 p.m.
Air mass	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
October										Mb.	Mb.
2	----	----	----	1.47	----	----	----	----	----		
3	----	----	----	1.46	----	----	----	----	----		
4	----	----	----	1.51	----	----	----	----	----		
5	----	----	----	1.47	----	----	----	----	----		
7	----	----	----	1.49	----	----	----	----	----		
8	----	----	----	1.45	----	----	----	----	----		
12	----	----	----	1.54	----	----	----	----	----		
13	----	----	----	1.51	----	----	----	----	----		
29	----	----	----	1.49	----	----	----	----	----		
31	----	----	----	1.51	----	----	----	----	----		
Averages	----	----	----	1.49	----	----	----	----	----		
Departures	----	----	----	+.01	----	----	----	----	----		

LINCOLN, NEBR.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	7:30 a.m.	1:30 p.m.
Air mass	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
October										Mb.	Mb.
1	0.62	0.73	0.90	1.10	1.32	1.08	0.92	0.79	0.69	15.3	20.4
2	----	----	----	----	1.27	1.01	.82	.69	.56	18.3	19.6
3	.60	.73	.88	1.08	1.32	1.10	.92	.75	.60	14.6	19.6
4	----	----	----	1.14	1.39	1.23	1.10	.99	.88	16.9	14.6
8	.88	.96	1.09	1.27	1.42	----	----	----	----	6.1	7.5
9	.79	.92	1.05	1.22	1.39	1.23	1.08	.97	.86	8.7	9.8
10	.81	.92	1.07	1.20	1.38	1.21	1.08	.94	.84	8.4	10.6
11	.77	.86	1.01	1.14	1.30	1.12	.97	.84	.73	9.8	13.7
12	.77	.85	.94	1.07	1.29	1.03	.84	.71	.60	11.8	13.2
14	.90	.98	1.09	1.24	1.40	1.23	1.08	.94	.84	10.2	10.2
Averages	.77	.87	1.00	1.16	1.35	1.14	.98	.85	.73		
Departures	-.01	-.03	-.06	-.08	-.08	-.08	-.06	-.06	-.07		

MADISON, WIS.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	7:30 a.m.	1:30 p.m.
Air mass	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
October										Mb.	Mb.
2	0.44	0.50	----	----	----	----	----	----	----	17.0	20.4
5	.66	.77	.96	----	----	----	----	----	----	15.3	14.2
8	.94	1.04	1.14	1.26	----	----	----	----	----	5.1	6.6
9	.71	.77	.90	1.07	----	----	----	----	----	6.6	10.2
10	.79	.87	1.08	1.26	----	----	----	----	----	5.3	6.6
12	.32	.39	.49	.70	----	----	----	----	----	8.7	11.8
15	.77	.87	.98	1.14	----	----	----	----	----	10.2	8.7
19	.88	.98	1.08	1.25	----	----	----	----	----	5.6	5.8
Averages	.69	.77	.95	1.11	----	----	----	----	----		
Departures	-.03	-.09	-.05	-.06	----	----	----	----	----		

BOSTON, MASS.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	7:30 a.m.	1:30 p.m.
Air mass	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
October										Mb.	Mb.
9	----	----	----	1.29	----	1.24	----	----	----	11.8	19.0
13	----	----	----	----	----	1.14	1.03	0.87	----	8.4	14.2
15	----	----	----	----	----	1.16	.93	.85	----	11.8	23.4
16	----	----	----	----	----	1.03	.77	.65	0.51	13.7	21.1
25	----	----	----	1.19	----	----	----	----	----	15.3	18.3
26	0.93	1.08	1.16	1.27	----	1.28	1.04	.99	.86	11.0	23.4
29	----	----	1.14	1.35	----	1.34	1.20	1.11	.96	9.4	12.7
Averages	.93	1.08	1.15	1.28	----	1.20	.99	.89	.78		
Departures	+.19	+.30	+.25	+.22	----	+.05	+.07	+.09	+.09		

ALBUQUERQUE, N.M.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	7:30 a.m.	1:30 p.m.
Air mass	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
October										Mb.	Mb.
1	0.94	----	----	1.35	----	----	1.17	----	0.94	7.9	9.1
3	----	----	----	----	----	1.32	1.15	1.07	.98	7.3	5.6
4	1.02	1.12	1.25	1.41	----	1.38	----	1.06	.90	3.8	5.0
5	.95	1.07	1.20	1.35	----	----	----	----	----	4.2	4.8
6	----	1.18	1.29	1.46	----	1.44	1.33	1.21	1.10	3.0	3.0
7	1.03	1.16	1.26	----	----	1.45	----	----	----	4.0	4.4
8	.98	1.10	1.22	1.37	----	1.33	1.06	.96	.86	2.9	4.2
9	1.02	1.16	1.27	1.00	----	1.46	1.32	1.24	1.08	3.3	4.0
10	1.18	1.28	1.36	1.44	----	----	----	----	----	1.5	2.1
11	.92	.99	1.10	1.25	----	----	----	----	----	2.1	3.6
12	.80	.92	1.05	1.26	----	----	----	----	----	4.2	5.4
13	1.06	1.21	1.33	1.44	----	1.47	1.32	1.23	1.04	2.3	1.9
14	1.09	1.22	1.32	1.46	----	----	1.33	1.21	1.05	1.3	2.1
15	1.07	1.22	1.31	1.47	----	----	1.36	1.24	1.04	1.2	2.3
RECORDER INOPERATIVE OCT. 16 - 22											
23	----	----	----	----	----	1.44	1.36	1.04	.95	1.8	1.8
24	1.07	----	----	----	----	1.37	----	----	----	1.7	1.8
25	----	----	----	----	----	1.31	----	----	----	5.0	7.9
26	----	----	----	1.03	----	----	----	----	----	7.9	8.2
27	----	----	----	1.30	----	1.47	1.33	1.22	1.12	5.6	5.2
28	----	----	----	----	----	----	1.29	1.17	1.08	4.6	5.6
29	1.14	----	----	1.47	----	1.42	1.25	1.16	----	3.3	3.3
31	----	----	1.29	1.42	----	----	1.30	----	----	7.9	4.8
Averages	1.02	1.14	1.25	1.34	----	1.41	1.27	1.14	1.01		
Departures	+.07	+.09	+.07	+.04	----	+.07	+.07	+.05	+.04		

BLUE HILL, MASS.

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	7:30 a.m.	1:30 p.m.
Air mass	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
October										Mb.	Mb.
1	----	----	----	----	----	0.75	0.59	0.46	0.31	8.4	9.2
20	----	----	1.14	1.22	----	1.19	1.02	.89	.75	5.7	7.0
21	0.83	0.93	1.06	1.22	----	1.15	.94	.83	.77	6.9	8.3
25	.79	.90	1.06	1.21	----	----	----	----	----	10.6	8.2
26	1.06	1.15	1.25	1.37	----	1.37	----	----	----	7.1	4.5
29	.95	1.06	1.20	----	----	----	1.25	1.14	1.05	4.8	4.0
Averages	.91	1.01	1.14	1.26	----	1.12	.95	.83	.72		
Departures	+.06	+.06	+.07	+.04	----	-.08	-.06	-.06	-.05		
RATIO BOSTON/BLUE HILL ON COMPARABLE DATES											
	0.88	0.94	0.93	0.95	----	0.93	0.96	0.97	0.91		

TACUBAYA, D. F., MEXICO

Date	A.M. 78.7°	A.M. 75.7°	A.M. 70.7°	A.M. 60.0°	0.0°	P.M. 60.0°	P.M. 70.7°	P.M. 75.7°	P.M. 78.7°	7:30 a.m.	1:30 p.m.
Air mass	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
										Mb.	Mb.
NO DATA DURING OCTOBER 1951											

*Extrapolated

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	1	2	3	4	5	6	7	Average	8	9	10	11	12	13	14	Average	15	16	17	18	19	20	21	Average
Langleys	291	234	27	70	42	182	24	124	257	472	90	48	452	477	493	327	422	438	80	28	425	474	463	333
Date	22	23	24	25	26	27	28	Average																
Langleys	155	408	46	351	520	226	4	244																

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	1	2	3	4	5	6	7	Average	8	9	10	11	12	13	14	Average	15	16	17	18	19	20	21	Average
Langleys	69	77	35	68	46	47	29	53	71	65	68	51	69	67	66	65	70	63	78	39	73	62	57	63
Date	22	23	24	25	26	27	28	Average																
Langleys	76	74	51	57	59	—	(51)	(61)																

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	1	2	3	4	5	6	7	Average	8	9	10	11	12	13	14	Average	15	16	17	18	19	20	21	Average
Langleys	120	160	42	103	59	55	40	83	106	43	131	99	84	54	58	82	119	69	129	54	103	57	67	86
Date	22	23	24	25	26	27	28	Average																
Langleys	137	140	63	79	44	129	7	86																

Note.–Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys

1951	Aklavik, Mackenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Barrow, Alaska	Bethel, Alaska	Bismarck, N.D.	Blue Hill, Mass.	Boston, Mass.	Brownsville, Tex.	Caribou, Me.	Charleston, S.C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Ely, Nev.	Fairbanks, Alaska	Fort Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Junction, Colo.	Grand Lake, Colo.	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Indianapolis, Ind.	Ithaca, N.Y.	Keflavik, Iceland	Lake Charles, La.	Las Vegas, Nev.
October 1----		493		414	485	64	197	394	317	332	552	411	411	276	508	359	304	119	334	(568)		108	551	496		243	422	384	460	558	502	611	387	164	146	(469)	477
October 2----		494		517	525	69	89	395	214	271	615	52	203	407	(362)	439	295	310	173	577		168	555	386		414	451	143	400	528	329	627	418	162	53	(546)	518
October 3----		503		559	506	49	211	293	43	32	596	243	313	427	472	424	269	62	293	572		112	526	509		142	406	154	454	542	64	644	414	394	156	556	514
October 4----		552		548	527	26	262	88	105	85	627	204	540	416	470	387	322	137	61	570		76	374	505		210	502	303	461	543	190	638	372	354	59	539	483
October 5----		551		532	472	20	234	305	60	57	617	121	513	365	263	361	155	82	109	573		60	496	504		155	399	179	419	517	455	615	364	406	33	499	509
October 6----		(570)		525	488	28	(205)	230	200	133	574	61	495	154	(58)	267	39	183	307	(552)		77	370	502		370	532	179	409	508	490	448	144	53	50	526	500
October 7----		557		495	458	21	89	413	40	67	235	409	(434)	131	119	64	22	99	301	481		136	594	511		405	540	366	401	495	503	474	72	24	40	534	492
Averages------		(531)		513	495	40	(184)	303	140	140	545	214	(416)	311	(322)	329	201	142	225	(556)		105	495	488		277	465	244	429	527	362	579	310	222	77	(524)	499
Departures----		+22		+51	---	--	+18	+5	-169	-135	+44	-71	+35	+14	-50	---	-49	-155	+17	+18		-10	+63	+53		-37	---	-131	---	+76	+6	+5	-36	-63	---	+100	+15
October 8----		525		496	551	27	110	403	202	219	574	55	(508)	399	522	255	156	218	---	538		109	550	497		409	528	486	464	569	150	578	511	175	106	571	459
October 9----		538		553	473	40	209	398	434	415	610	154	249	106	381	442	253	395	---	(542)		171	566	481		414	510	496	448	528	56	606	353	---	54	553	423
October 10----		533		522	483	23	161	389	143	159	588	440	112	346	432	320	324	149	---	555		127	554	485		396	490	485	304	507	89	593	351	---	103	555	313
October 11----		492		533	508	28	220	223	93	95	572	249	287	287	455	363	314	68	---	555		45	557	485		298	458	342	398	526	184	619	307	---	150	533	414
October 12----		353		533	490	31	263	133	363	361	537	332	486	365	433	361	298	333	---	452		122	531	459		375	473	458	444	507	490	541	314	278	116	525	449
October 13----		534		437	492	16	(222)	274	410	415	569	405	447	411	445	366	302	396	---	530		156	500	464		388	498	191	422	505	(366)	408	385	421	27	476	460
October 14----		523		467	492	18	219	340	411	393	557	406	274	369	447	356	280	387	---	526		120	449	463		258	509	481	398	493	401	605	365	405	107	492	443
Averages------		500		506	498	26	(201)	309	294	294	572	291	(338)	326	445	352	275	278	---	(528)		122	530	476		363	495	420	411	520	(248)	564	369	320	95	529	423
Departures----		+16		+59	---	--	+42	+25	-10	+61	+65	+26	-14	+40	+73	---	+58	+2	---	+11		+33	+96	+75		+78	---	+48	---	+76	-89	+8	+19	+50	+4	+116	-16
October 15----		510		276	501	19	186	201	346	326	497	374	299	367	309	346	318	374	---	479		69	488	453		202	---	408	294	506	297	440	353	363	107	482	426
October 16----		504		476	498	28	179	334	365	321	443	306	298	377	404	275	278	336	---	502		165	510	456		305	145	124	308	504	443	484	368	298	115	498	327
October 17----		463		509	483	29	182	134	118	95	286	325	309	354	256	299	254	179	---	515		132	413	441		132	461	300	441	494	327	369	358	364	63	(465)	408
October 18----		476		505	475	14	192	128	37	53	507	344	289	341	136	307	261	120	---	495		127	469	435		179	---	428	289	488	92	463	329	379	26	(460)	426
October 19----		429		482	451	11	172	50	350	310	177	322	216	140	317	336	200	311	---	511		131	492	418		115	---	273	398	473	438	453	280	103	93	(471)	412
October 20----		462		336	419	10	75	49	374	360	525	190	258	367	292	353	173	341	---	491		104	476	424		94	430	191	221	445	435	524	357	384	75	479	399
October 21----		386		399	102	32	52	120	356	346	564	367	152	341	338	327	268	359	---	393		141	473	434		138	261	106	291	113	185	481	348	323	48	396	422
Averages------		462		426	418	20	148	145	278	259	428	318	260	327	293	320	250	289	---	484		124	475	437		167	324	262	320	432	317	459	342	316	75	(464)	403
Departures----		+17		+30	---	--	+18	-109	-8	+5	-43	+86	-24	+49	-39	---	+24	+22	---	+6		+48	+86	+69		-61	---	-94	---	+75	-5	-28	+29	+55	-2	+85	+10
October 22----		477		355	123	8	77	293	176	162	443	333	73	238	144	222	93	309	---	403		129	292	429		319	355	393	184	98	332	585	154	238	65	364	391
October 23----		477		429	167	6	22	329	321	293	(324)	115	252	228	34	207	26	329	---	519		120	440	420		236	416	400	364	246	267	593	78	286	43	154	407
October 24----		438		303	312	7	49	268	63	102	232	21	335	66	387	54	29	145	---	447		57	413	160		147	372	402	273	281	391	279	84	103	119	217	298
October 25----		354		413	427	9	53	65	278	300	315	33	253	351	412	345	272	313	---	405		57	214	364		118	64	208	349	449	404	391	360	105	20	336	129
October 26----		235		---	226	6	45	320	369	399	448	316	303	267	172	260	150	331	---	420		75	99	392		263	51	148	---	224	452	488	310	241	19	438	187
October 27----		449		435	89	7	138	270	201	200	502	126	397	27	42	83	127	194	---	337		29	139	398		234	360	85	---	146	443	151	42	45	43	275	406
October 28----		210		404	297	6	17	248	7	13	419	222	197	223	402	271	43	19	---	385		29	208	399		307	391	299	---	326	285	422	323	95	51	293	415
Averages------		377		390	234	7	57	256	202	210	(383)	167	258	200	228	206	106	234	---	417		71	258	366		232	287	276	292	253	368	415	193	159	51	297	319
Departures----		-38		-7	---	--	-43	+17	-12	+28	-58	-12	-28	-19	-53	---	-67	+24	---	-30		+12	-90	+19		+33	---	-47	---	-39	+38	-59	-45	-14	-1	-56	-57
Accumulated Departures January 1 to October 28, 1951		+1463		+1386	---	---	-2604	---	-133	+1512	---	---	---	---	---	---	-5397	-3836	---	---		---	---	---		---	---	+700	---	---	---	+2569	---	+140	---	+1617	-2324

Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

SOLAR RADIATION DATA

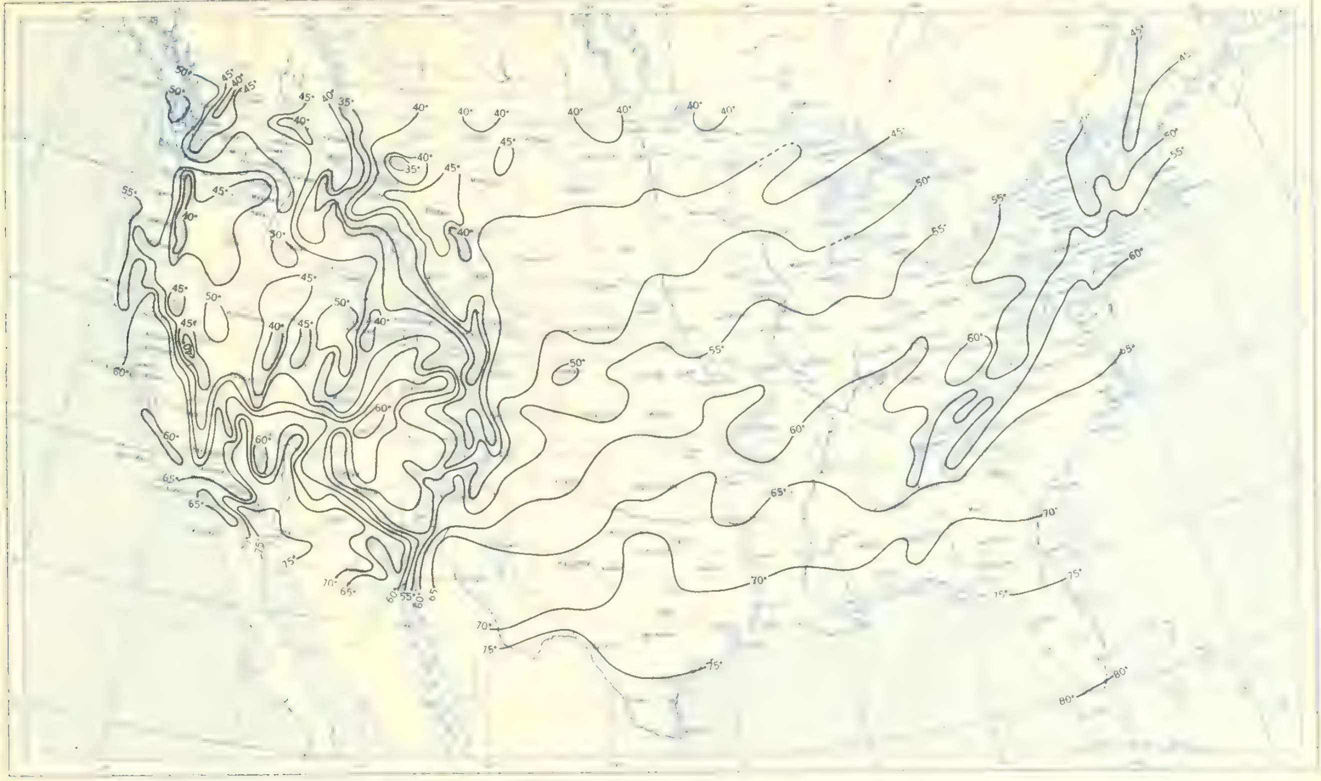
Table 33.–Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys –Continued

	Lincoln, Nebr.	Little Rock, Ark.	Lynn, Mass.	Madison, Wis.	Medford, Oreg.	Miami, Fla.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ontario	Pearl Harbor, T.H	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S.D.	Riverside, Calif.	St. Cloud, Minn.	Salt Lake City,Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste.Marie, Mich.	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle, Wash. (U. of W.)	Seattle, Wash. (WBAS)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W.I.	Thule, Greenland	Toronto, Ontario	Upton, N.Y.	Wake Is., Pac. Area	Washington, D.C. (WBCO)	Winnipeg, Manitoba
1951																																					
October 1----			313	335	128	162	465	172		70	429	123	568	495	397	437	403		159	584	544	162	387	270	380	159	159	157	287	449	610		100	294		352	343
October 2----			149	259	211	158	467	372		184	477	59	506	539	415	328	516		389	557	426	91	369	103	431	182	100	100	333	460	625		220	(374)		448	55
October 3----			10	387	336	534	482	68		202	484	290	591	541	447	80	451		214	555	544	93	210	249	414	246	365	153	380	457	595		296	(165)		421	190
October 4----			87	132	419	322	449	73		256	479	361	612	545	442	133	486		206	564	541	90	55	354	80	339	384	160	273	463	(614)		321	64		(158)	113
October 5----			62	177	459	596	432	81		158	416	287	612	529	370	137	517		174	496	534	49	199	332	382	136	162	280	390	225	(550)		277	198		444	173
October 6----			107	54	436	590	384	264		164	396	76	560	561	135	413	528		440	490	546	367	417	396	402	53	142	150	360	76	(599)		98	411		389	121
October 7----			55	85	446	561	101	67		383	235	58	490	527	97	347	512		443	511	540	71	33	24	102	344	322	369	52	486	636		12	46		93	363
Averages------			112	204	348	418	397	156		202	417	179	563	534	329	268	488		289	537	525	132	238	247	313	208	234	195	297	374	(604)		189	(222)		(329)	194
Departures----			-144	-79	+31	---	+46	-151		00	+58	-70	+36	+24	-5	-67	+93		-45	---	+38	---	-83	---	00	+7	---	-68	+7	-11	---		-66	-93		---	-57
October 8----			150	410	396	460	293	292		340	178	196	476	451	153	440	489		418	540	522	311	355	233	427	326	345	439	305	447	552		77	357		477	186
October 9----			378	396	(411)	276	440	434		---	473	301	498	487	437	432	364		407	576	525	325	409	335	371	295	311	284	290	466	331		184	(389)		360	341
October 10----			106	399	340	598	468	186		66	375	406	582	485	448	415	453		363	555	502	391	219	327	149	141	84	332	354	450	423		357	(304)		144	317
October 11----			77	337	164	593	417	71		226	451	234	621	440	437	388	467		357	542	507	203	36	58	93	253	233	167	69	442	495		119	75		211	334
October 12----			314	331	340	234	442	342		114	456	417	463	518	413	252	471		(210)	499	516	400	380	360	362	97	147	133	315	394	285		375	419		418	282
October 13----			380	347	374	216	425	428		267	440	381	434	519	445	254	502		---	394	506	371	446	372	437	187	236	221	419	357	576		357	469		415	57
October 14----			339	213	138	263	440	432		---	460	381	568	512	383	374	485		417	446	507	306	436	413	374	204	264	88	379	64	612		299	455		408	316
Averages------			239	348	309	377	418	312		203	405	331	520	487	388	365	462		(362)	507	512	330	326	300	316	215	232	238	305	374	468		253	(352)		348	262
Departures----			-1	+85	+6	---	+110	+8		+11	+64	+83	+23	+5	+108	+68	+81		+45	---	+40	---	+29	---	+30	+40	---	-14	+55	+12	---		+37	+52		---	+41
October 15----			273	355	400	500	392	410		250	453	286	461	518	400	189	472		76	473	498	309	390	266	377	45	56	---	373	380	529		255	417		405	154
October 16----			304	178	402	171	442	378		258	449	336	489	507	397	361	335		150	504	475	122	393	258	399	225	226	---	339	183	461		271	386		390	292
October 17----			101	39	368	394	426	224		190	435	283	422	487	380	133	374		353	446	479	149	315	309	250	48	70	---	354	225	514		225	245		346	234
October 18----			3	23	136	239	388	276		238	412	334	497	490	337	298	445		356	453	478	(135)	232	272	294	70	50	---	369	193	590		283	262		291	304
October 19----			278	294	241	563	120	355		164	382	156	447	473	344	238	435		315	451	466	(231)	280	197	204	214	164	177	183	259	613		215	295		97	54
October 20----			305	221	172	503	292	391		203	402	324	534	476	349	66	433		151	486	467	129	409	342	246	165	198	41	386	371	571		141	431		165	78
October 21----			345	57	239	375	148	379		57	78	318	526	479	361	95	430		(248)	495	446	12	266	324	100	74	65	132	300	353	544		266	244		107	233
Averages------			230	167	280	392	315	345		194	373	291	482	490	367	197	418		(236)	473	473	(155)	327	281	267	120	118	---	329	280	546		237	328		257	193
Departures----			-19	-67	+12	---	+10	+57		+9	+69	+52	+19	+34	+90	-73	+67		-38	---	+43	---	+56	---	+5	-26	---	---	+68	-45	---		+11	+48		---	+3
October 22----			126	260	122	287	269	319		48	229	---	610	---	262	364	432		177	325	471	82	259	195	194	81	98	153	50	85	582		77	224		112	---
October 23----			234	36	65	395	168	361		209	245	---	530	---	125	379	444		226	383	457	129	141	201	205	132	148	79	92	126	558		20	170		243	---
October 24----			---	345	165	479	265	197		277	417	---	486	454	69	250	424		44	271	168	33	88	157	209	140	189	264	111	399	526		31	163		107	---
October 25----			---	262	242	430	320	334		311	356	---	456	(453)	382	78	221		99	109	222	293	360	101	331	278	297	267	263	204	(490)		251	352		387	---
October 26----			295	127	183	445	291	370		313	261	---	491	360	231	71	428		219	225	443	63	371	251	371	250	287	102	247	125	531		162	397		338	---
October 27----			173	268	247	504	72	238		304	208	---	188	456	56	337	424		347	362	437	138	244	80	308	206	274	160	159	226	(538)		187	291		318	---
October 28----			---	242	253	486	72	14		---	165	---	372	423	185	306	431		330	220	442	88	36	23	186	108	139	258	72	246	580		60	60		170	---
Averages------			207	220	182	432	208	262		244	268	---	448	(429)	187	255	401		206	271	377	118	214	144	258	171	205	183	142	201	(544)		113	237		239	---
Departures----			-30	+6	-43	---	-38	+34		+87	+10	---	+7	-8	-47	-7	+71		-63	---	-21	---	-22	---	+15	+47	---	-16	-66	-94	---		-55	+4		---	---
Accumulated Departures January 1 to October 28, 1951			---	-4928	+2401	---	+7798	+2254		---	+3952	+1372	+6440	---	---	---	+8022		-315	---	-1645	---	+1253	---	+2373	---	---	-1526	+2408	---	---		-1197	+4963		---	-105

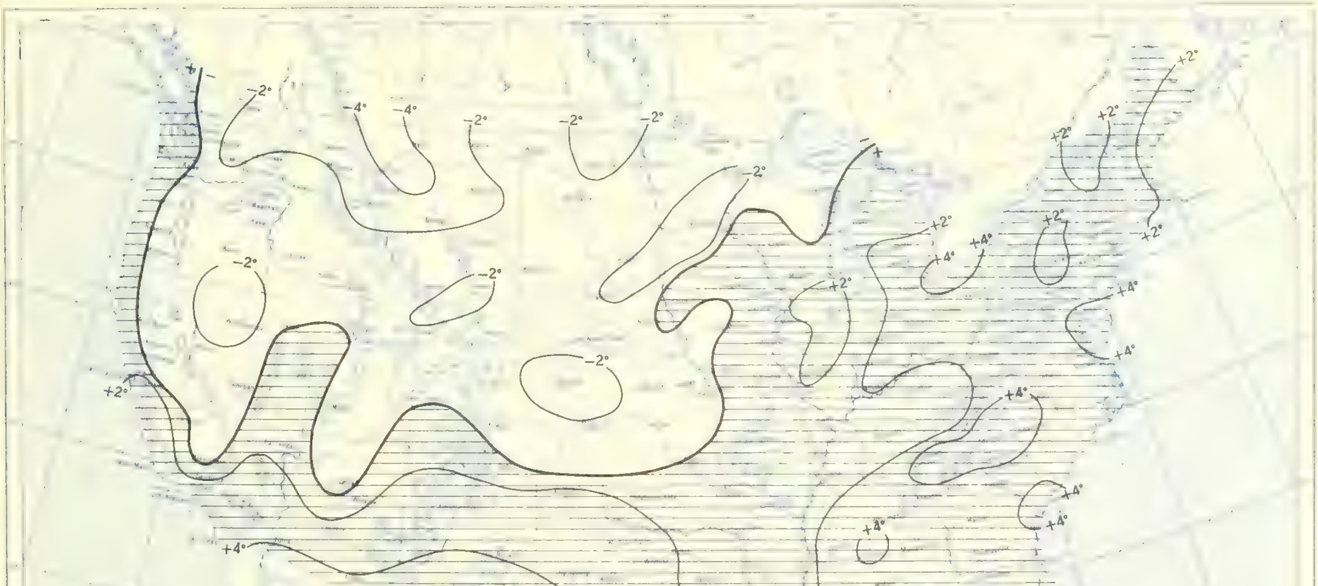
Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

W.B.T.U., New Orleans, Louisiana --- 2/29/52 --- 2000

Chart I. A. Average Temperature (°F.) at Surface, October 1951.



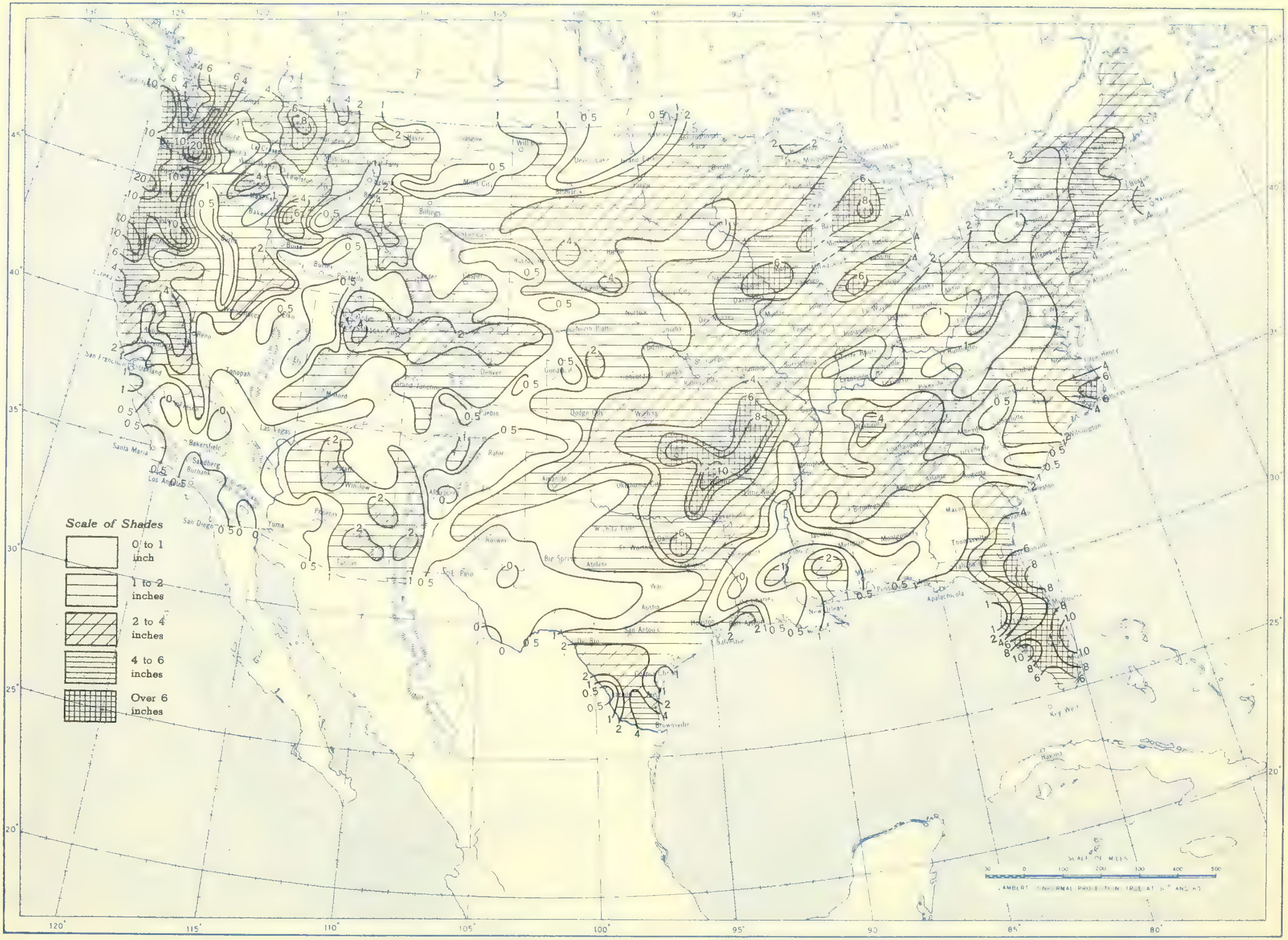
B. Departure of Average Temperature from Normal (°F.), October 1951.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

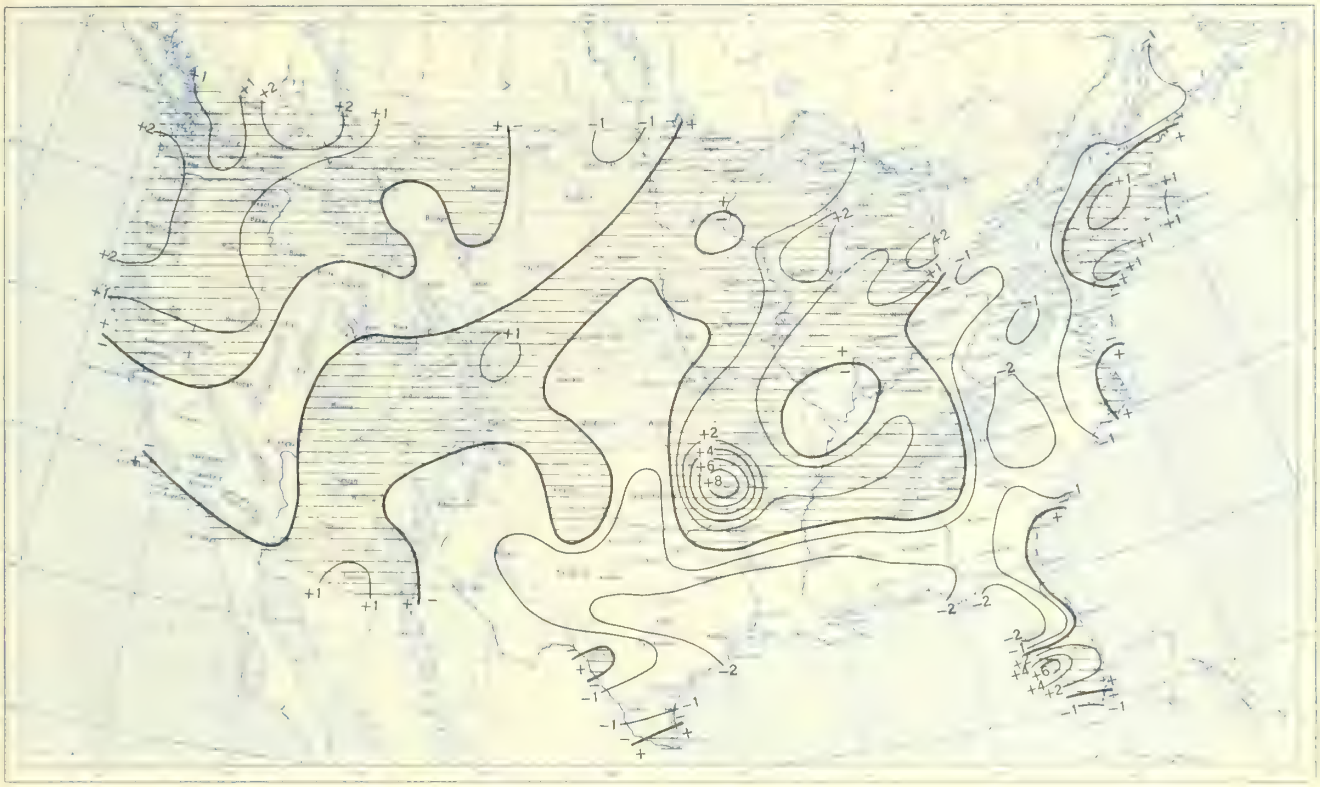
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), October 1951.

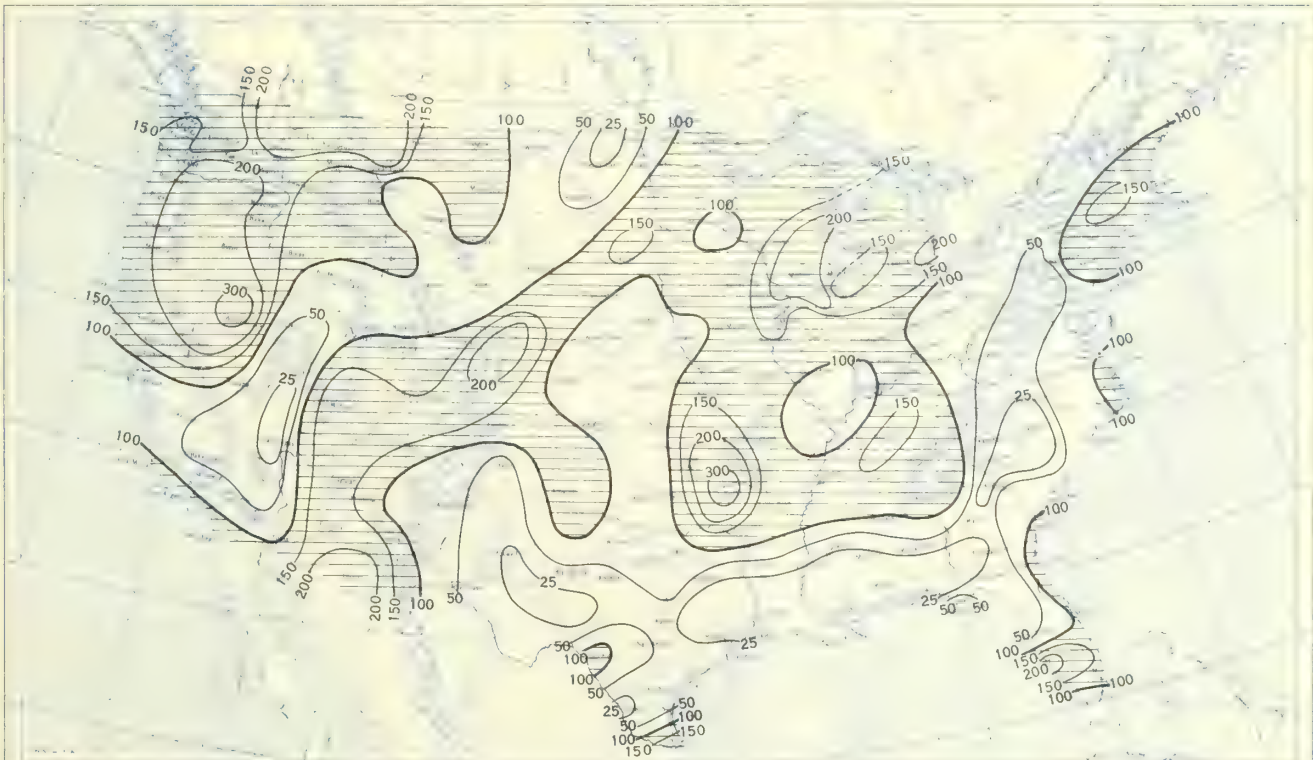


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), October 1951.

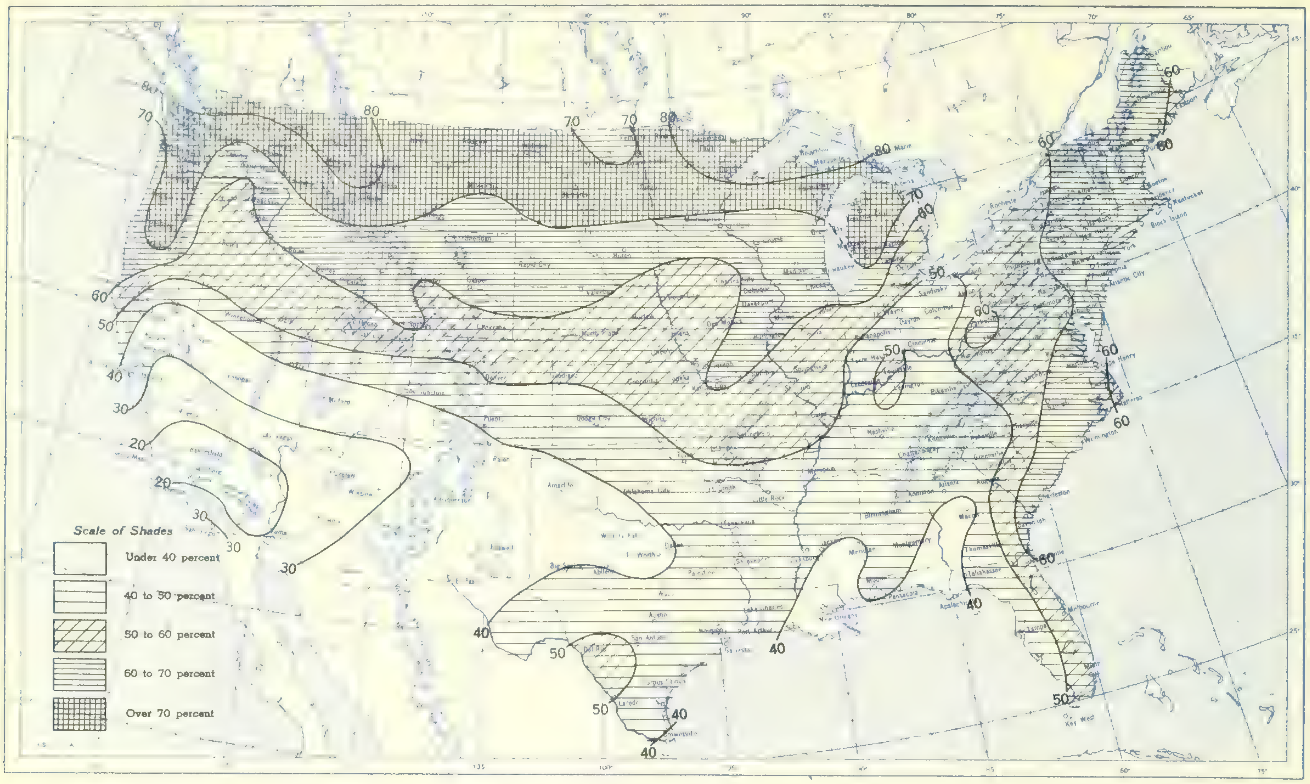


B. Percentage of Normal Precipitation, October 1951.

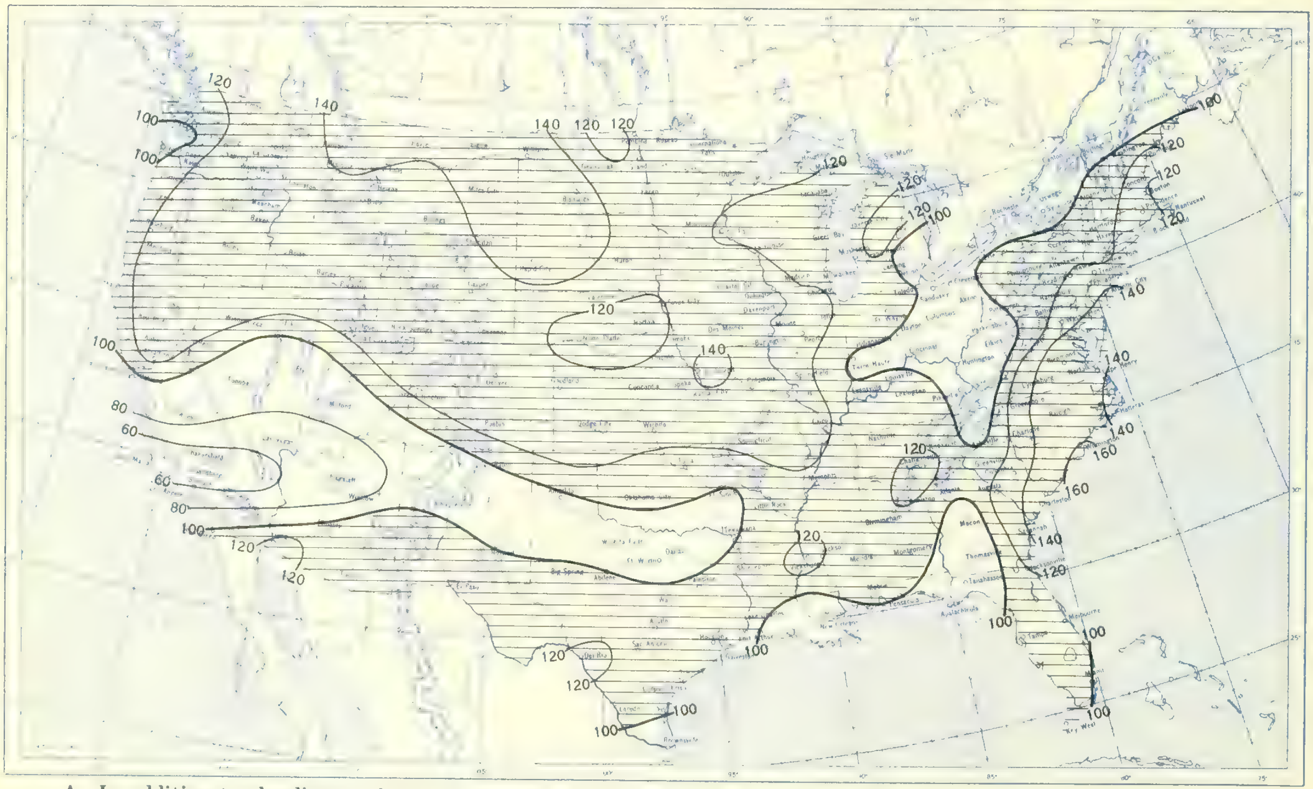


Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, October 1951.

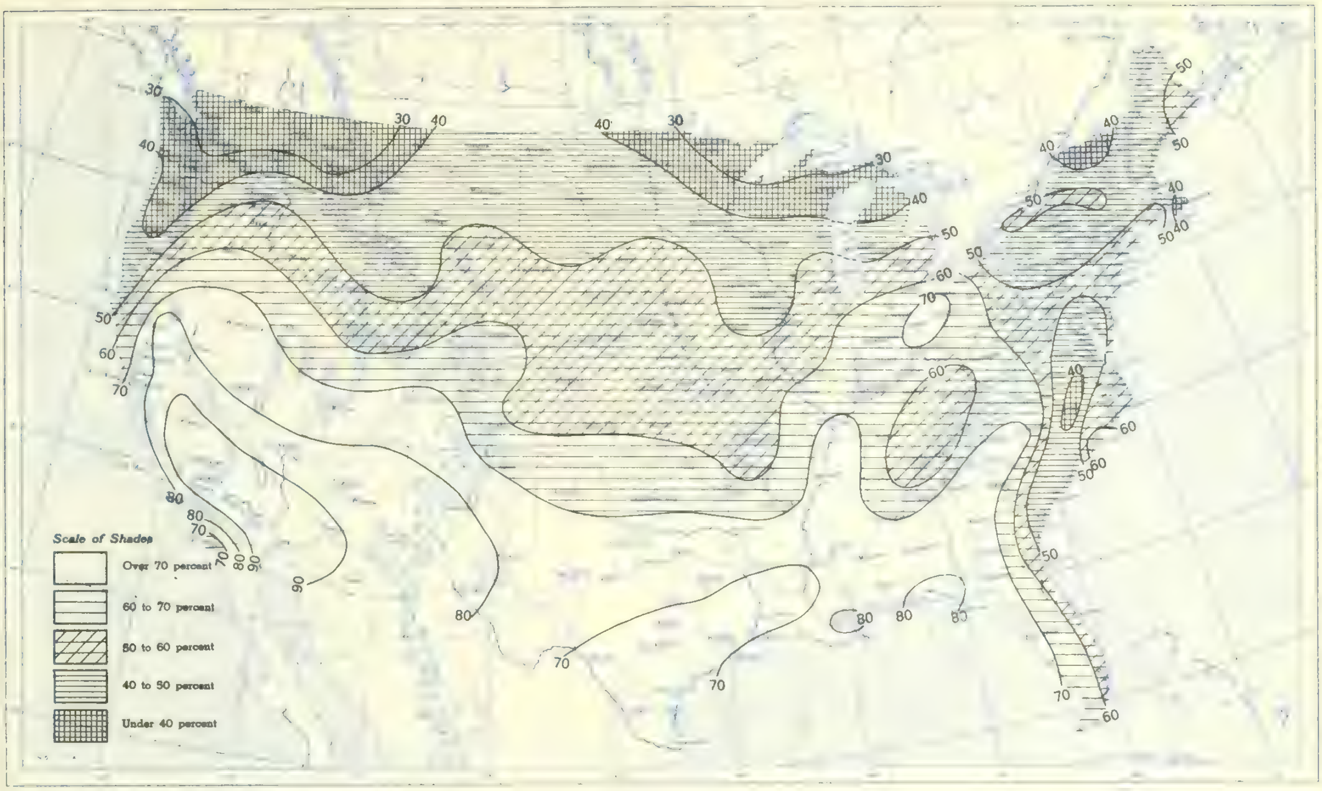


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, October 1951.

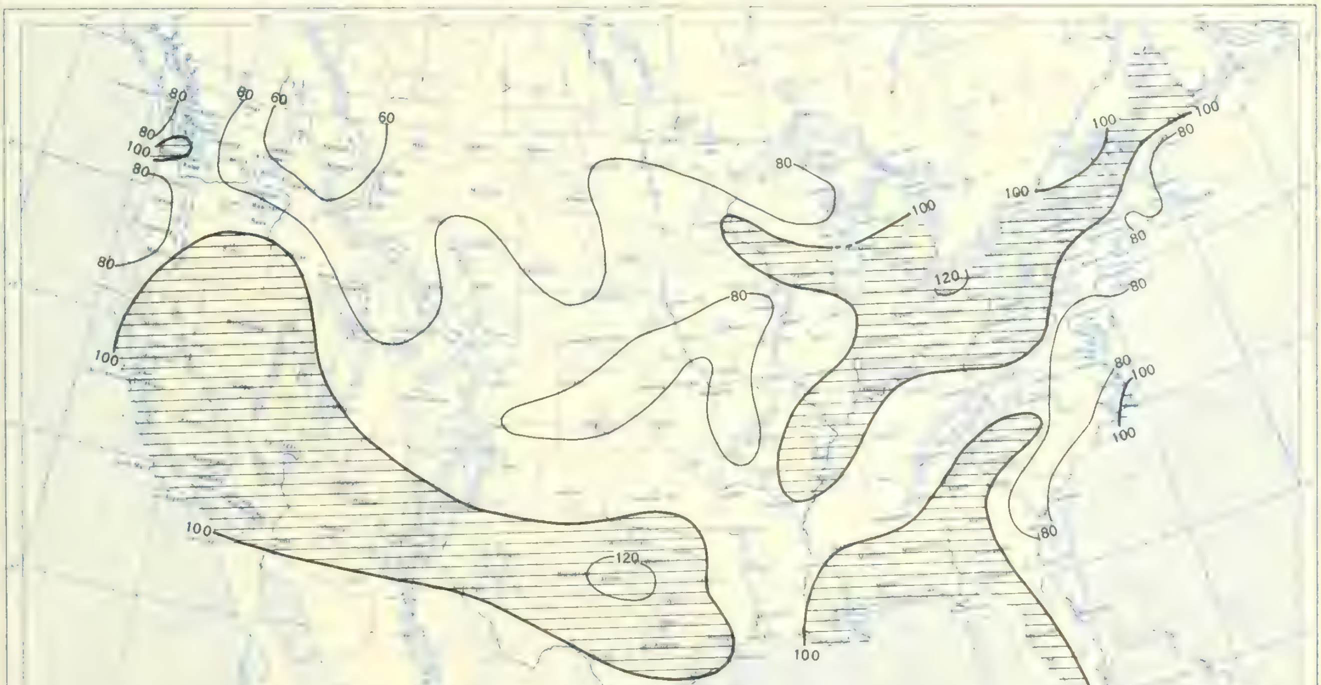


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, October 1951.



B. Percentage of Normal Sunshine, October 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, October 1951. Inset: Percentage of Normal Average Daily Solar Radiation, October 1951.

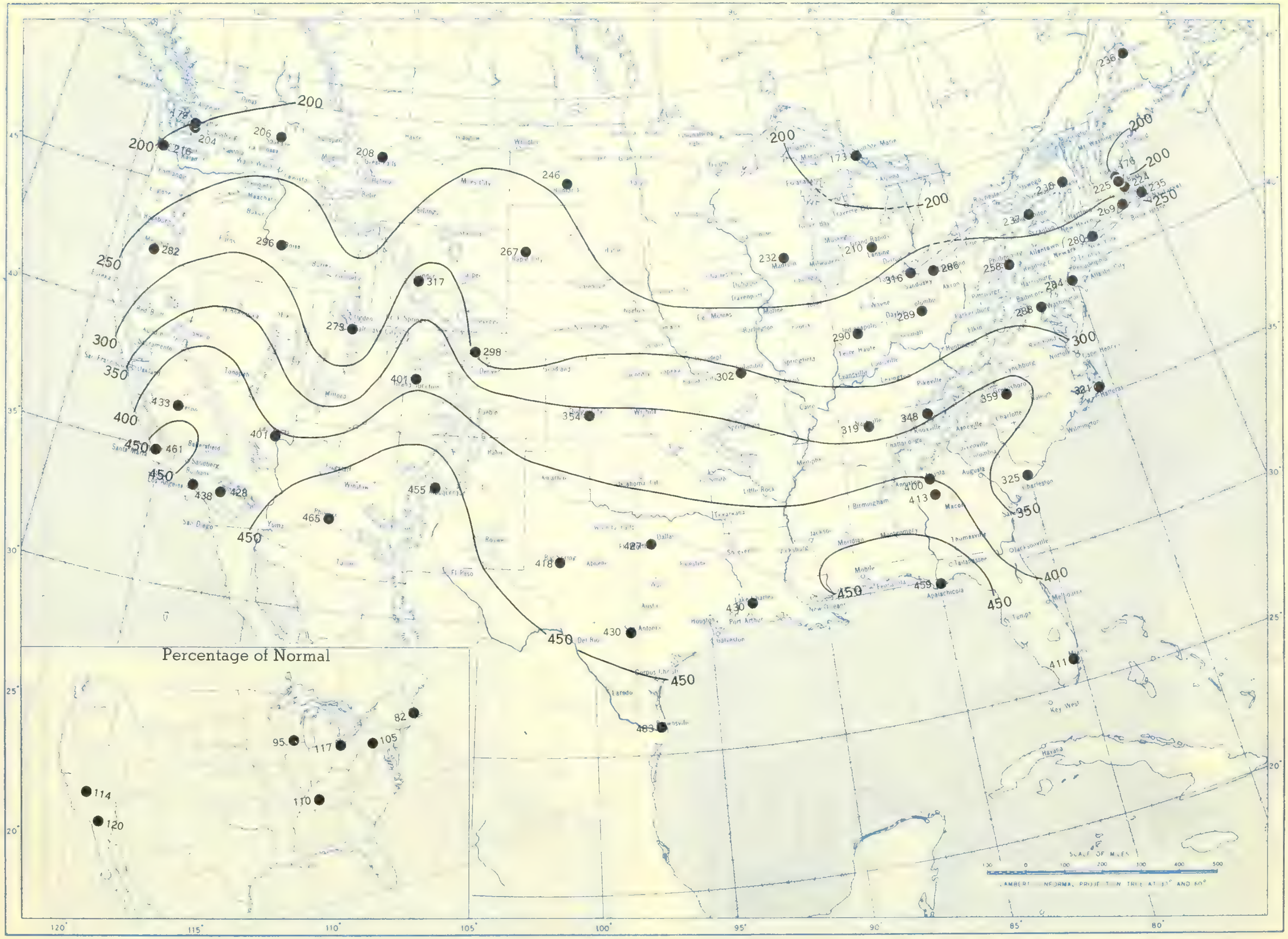
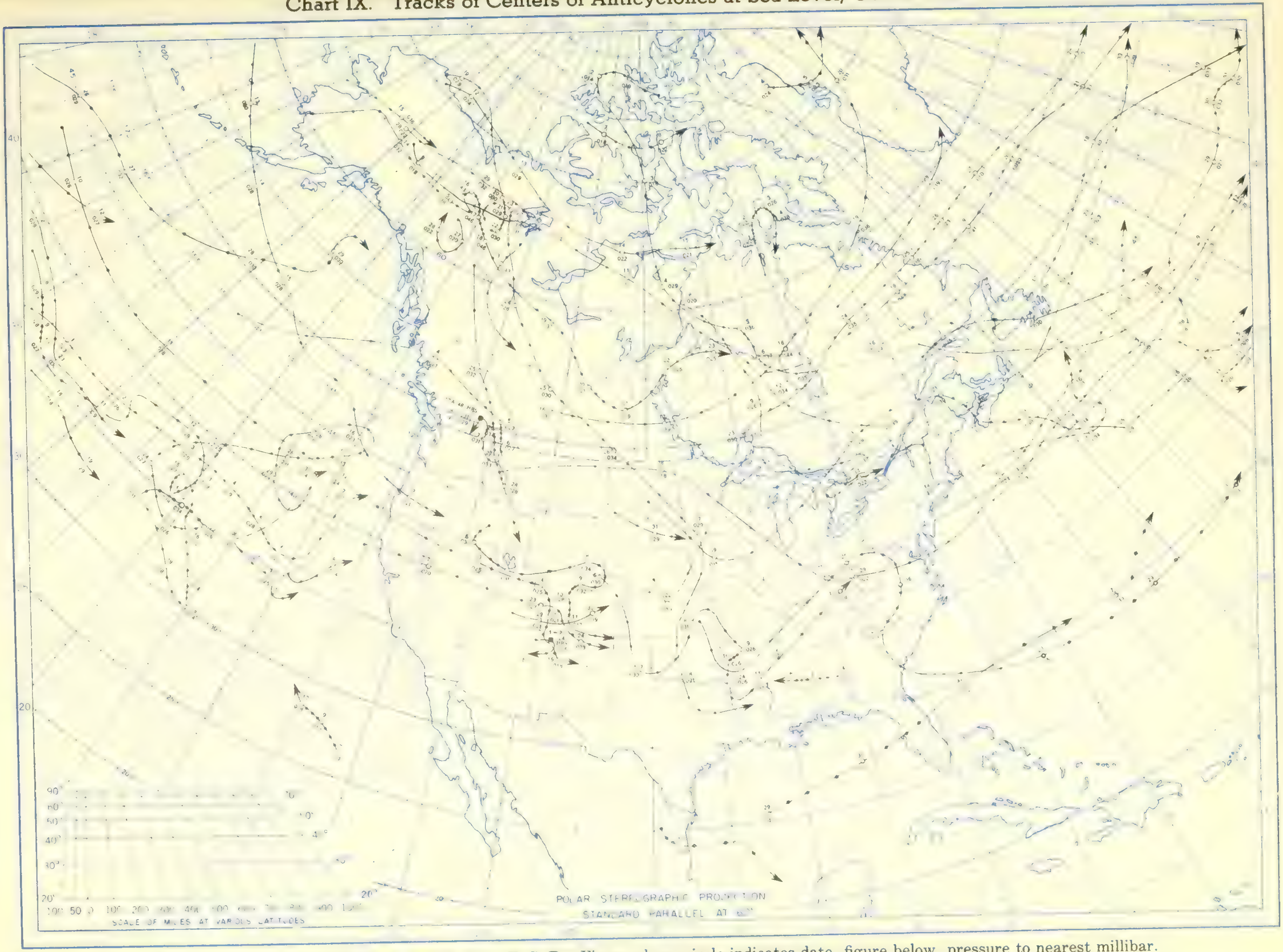


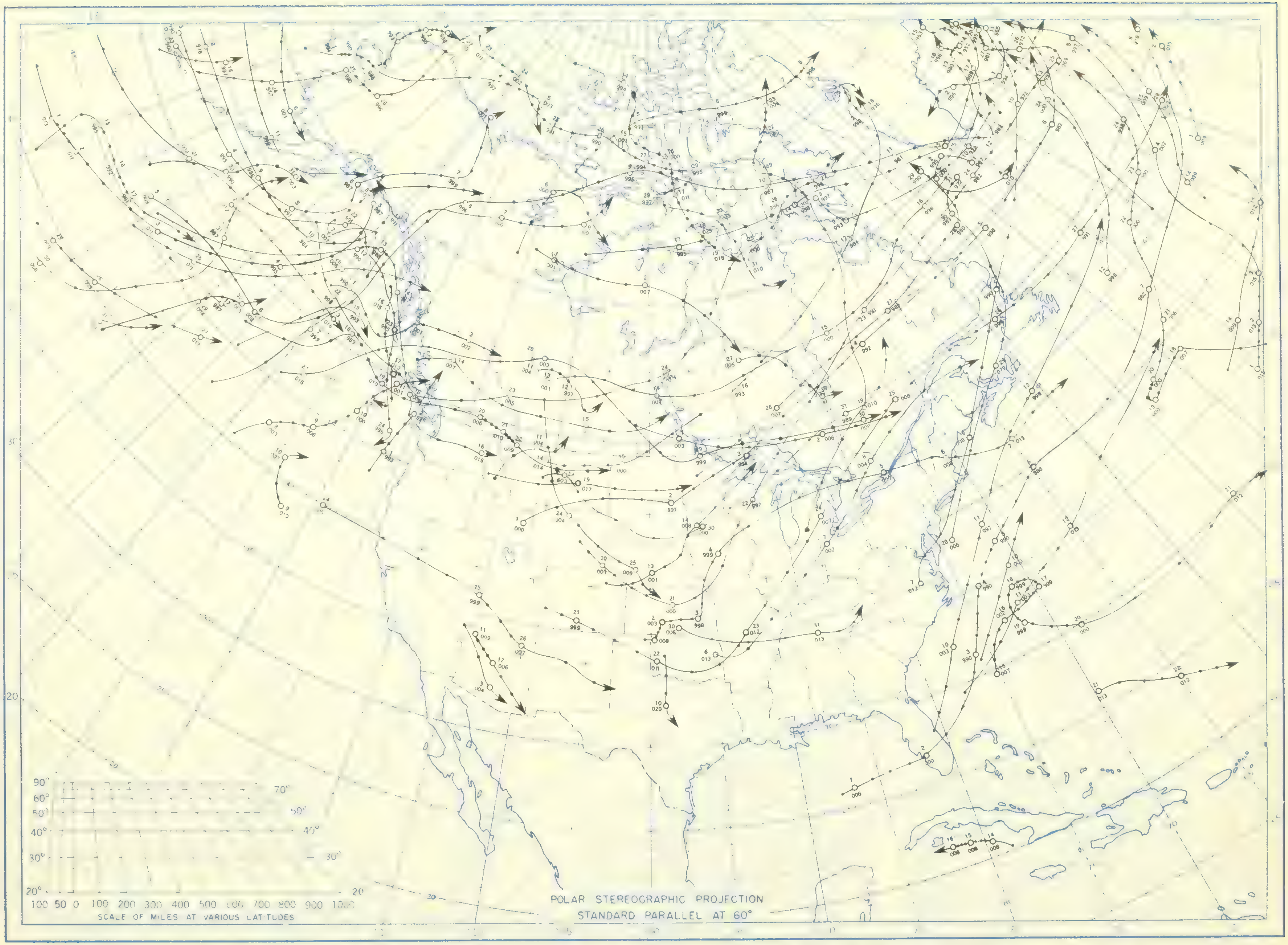
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart IX. Tracks of Centers of Anticyclones at Sea Level, October 1951


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES
90°
60°
50°
40°
30°
20°
40
30
20

Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

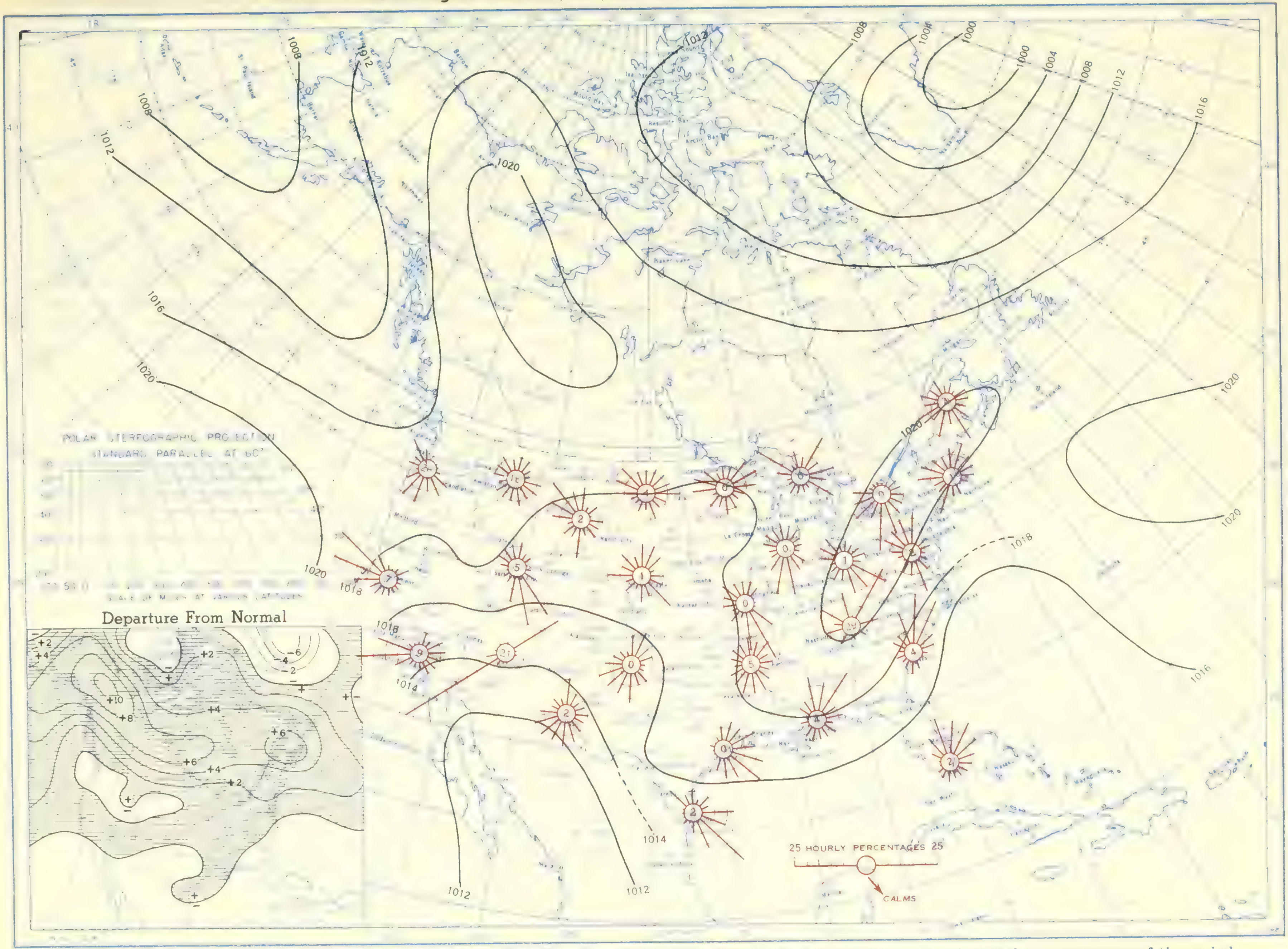
Chart X. Tracks of Centers of Cyclones at Sea Level, October 1951.



Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

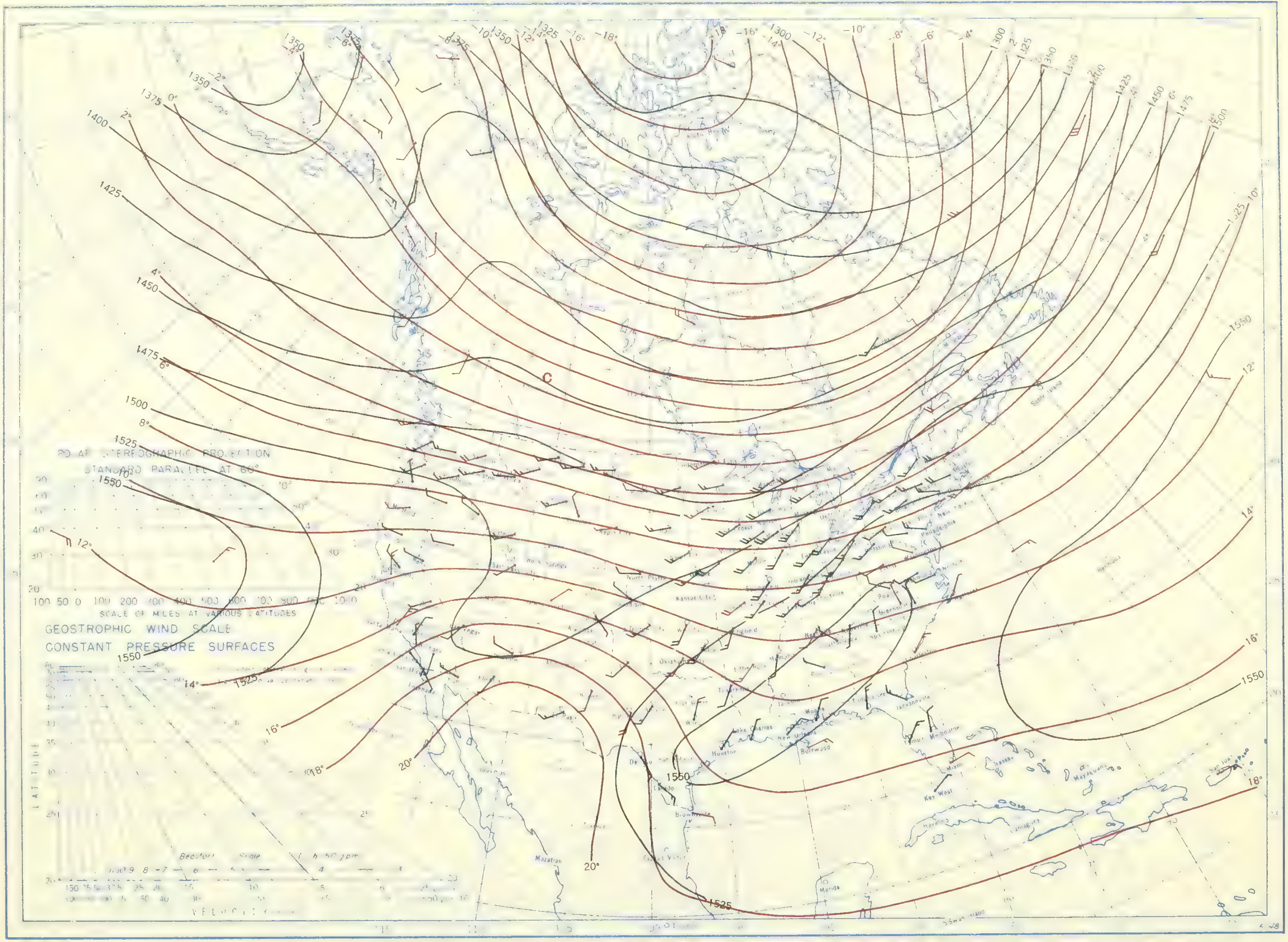
Chart XI. Average Sea Level Pressure (mb.)

Average Pressure (mb.) from Normal, October 1951.



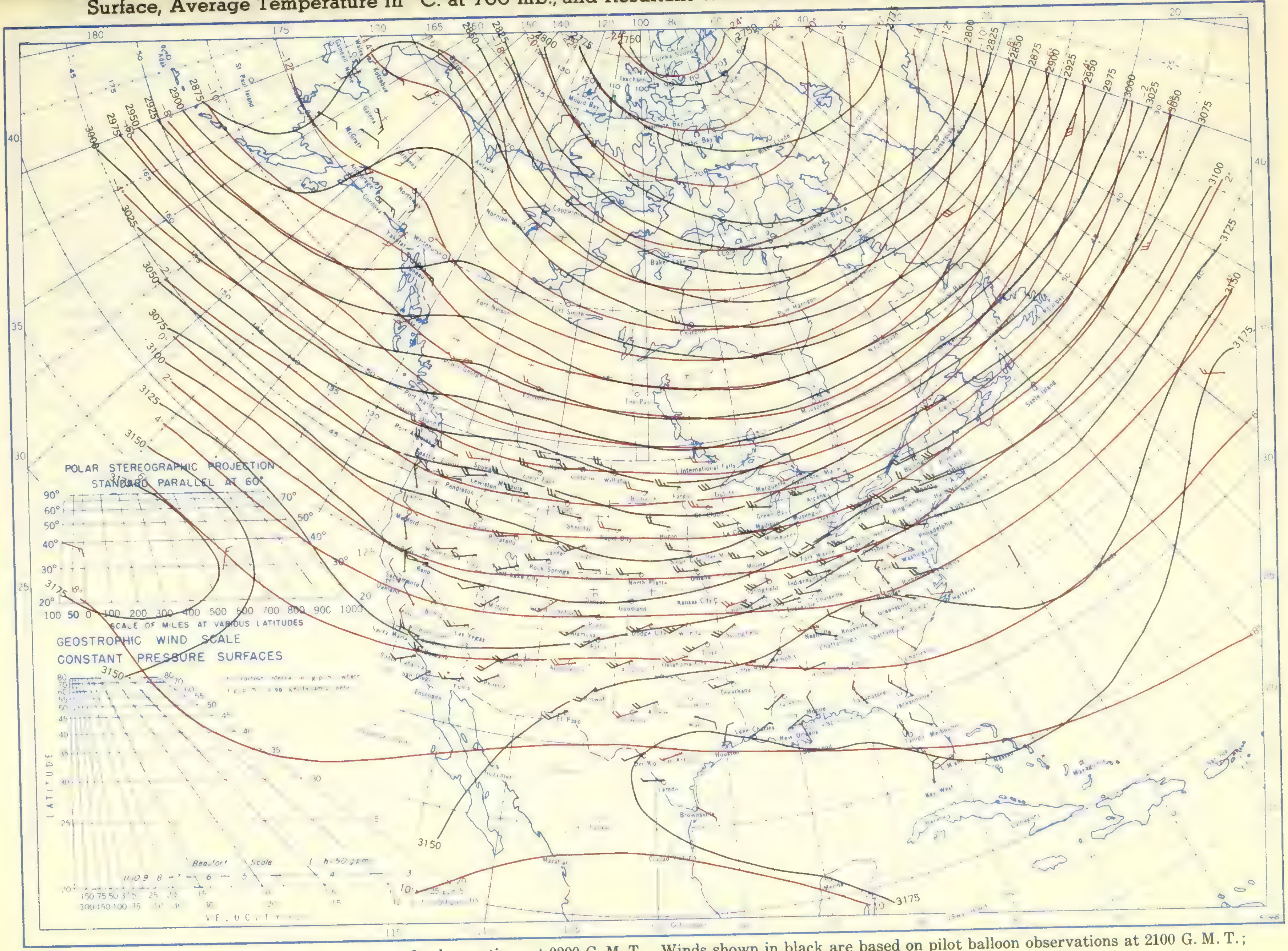
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid from map readings for 20 years of the Historical Weather Maps, 1899-1939.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), October 1951.



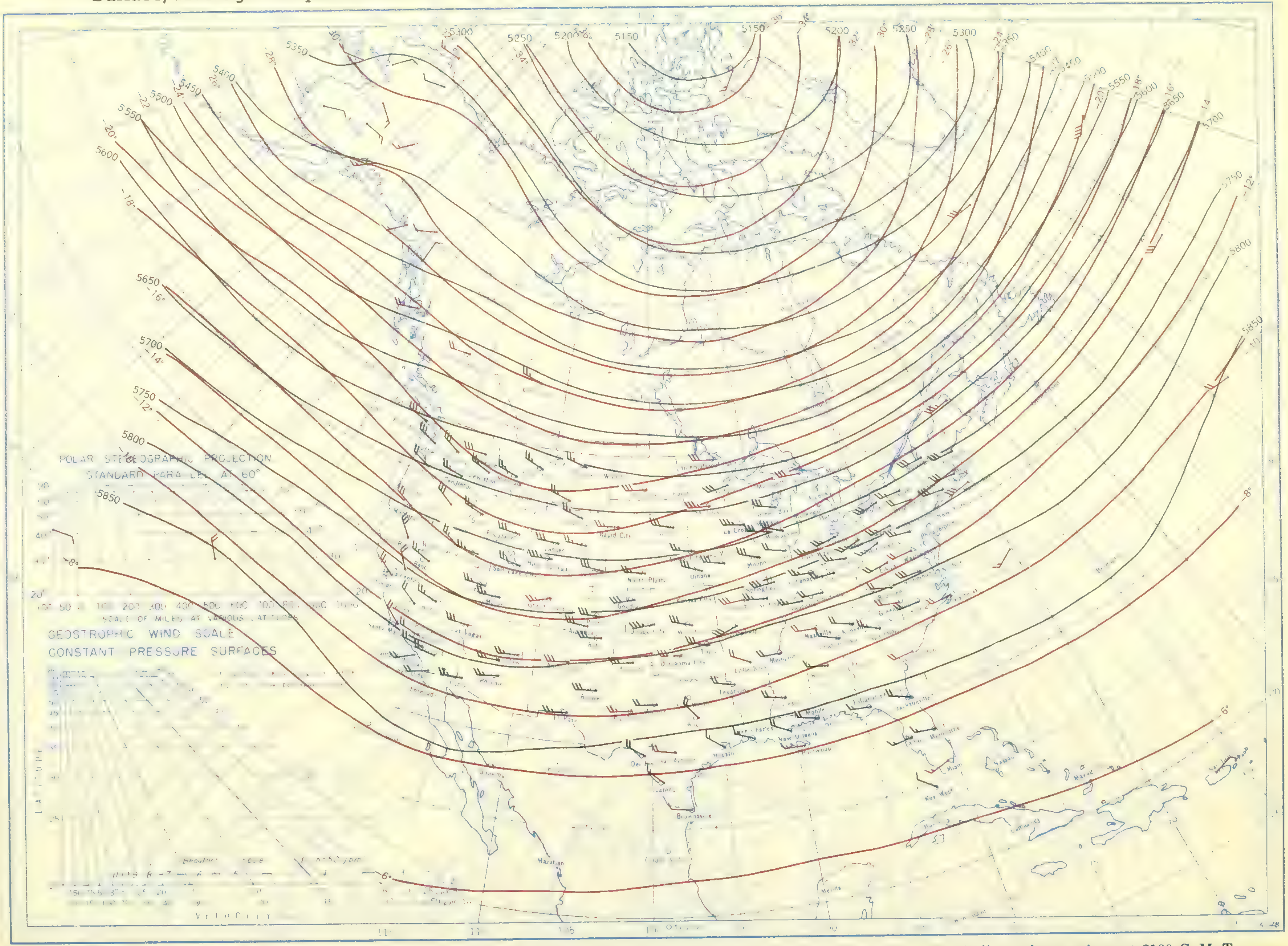
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Chart XIII. Average Dynamic Height in Geopotential [illegible] 700 mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), October 1951.



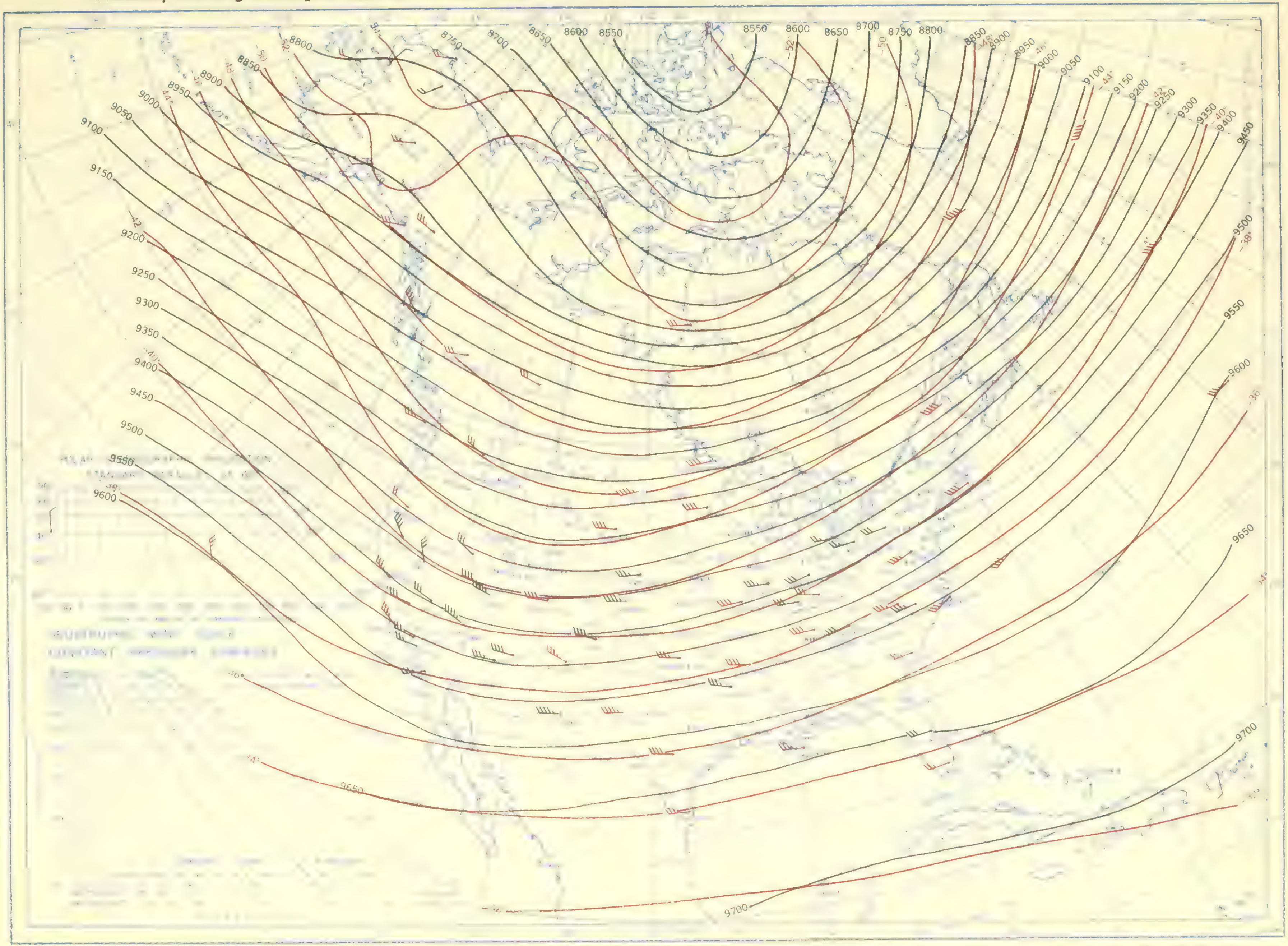
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), October 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.;

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters), of the
Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), October 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

NOVEMBER 1951
Volume 2 No. 11

NEW ORLEANS: 1952

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions---------------------- 329

Condensed Climatological Data - States--------------------- 330

Climatological Data - Stations----------------------------- 331

Heating Degree Days-- 336

Severe Storms-- 337

General Summary of River and Flood Conditions-------------- 341

Flood Stage Data--- 342

UPPER AIR DATA

Radiosonde Data-- 343

Pilot Balloon Data--- 346

Rawin Data--- 347

SOLAR RADIATION DATA

Solar Radiation Intensities-------------------------------- 348

Blue Hill Data--- 349

Daily Totals and Average Daily Totals by Weeks------------ 350

CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 11

NOVEMBER 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

November was much colder and somewhat wetter than usual. Snowfall was much above normal in the northeastern quarter of the country, and set new records in several sections. Winter-like weather began during the opening days of the month and many streams and most small lakes were frozen over in extreme north-central areas during the first week.

The Nation-wide average temperature was 39.8° which was 3.6° below the long-term mean. This was the lowest average since 1911 and the second lowest since the beginning of Nation-wide averages in 1893. Average temperatures for the month were above normal only in California, along the north Pacific Coast, in extreme western Nevada, southern Arizona, and at a few stations in the northern Rocky Mountain Region and extreme eastern New England. State-wide November averages were all below normal except for California, and were the lowest on record for Wisconsin, Michigan, Indiana, Illinois, Missouri, Kentucky, Tennessee, Arkansas, and Mississippi. In a number of nearby States November averages were the second or third lowest on record.

The first week was one of the coldest on record for early November. Average temperatures for the period were below normal nearly everywhere, with daily departures for the period averaging 15° to over 20° in central and north-central areas. Record early-season low temperatures were widespread in central areas and also occurred at many eastern stations. Lowest temperatures in central sections during the period ranged from -36° in Colorado to 38° at Brownsville, Texas. Subzero minima occurred in north-central areas as far south as Illinois, Missouri, Kansas, and northeastern New Mexico. Many stations in Texas, Louisiana and Mississippi experienced the earliest killing frost or freeze on record. Also, one of the earliest snowfalls on record occurred in northern Louisiana, and northern and central Mississippi. A record November low temperature was established for Oklahoma, when -9° was recorded at Kenton on the 3d.

This cold period was followed by a general rise in temperatures, with many stations in central areas recording their highest of the month from about the 10th to the 14th. In the far West and extreme southern areas highest temperatures were recorded early in the month. The highest temperature for the month was 95° at Falfurrias and Laredo, Tex., on the 13th and at Mc Cook, Tex., on the 14th. At many Texas stations record late-season high temperatures occurred from the 13th to the 15th.

The last half of the month was predominantly cold, although in most sections there were brief periods with above-normal temperatures. Many stations in the Northwest and Southeast recorded their lowest temperatures of the month during the latter half of the second decade, while lowest temperatures occurred in New York and New England on the 28th. The lowest temperature of the month, -36°, was recorded at Dillon, Colo. on the 7th, and at Bondurant, Wyo. on the 16th. Average temperatures for the month ranged from the low 70's in extreme southern Florida to the middle teen's in the northern Rockies.

The United States average precipitation was 2.33 inches which was 0.28 inch above the long-term mean. Monthly totals were generally above normal east of the Mississippi and in most sections west of the Continental Divide. In the far West the greatest totals were recorded along the north Pacific Coast and ranged up to 22.71 inches at Spruce, Wash., the greatest total recorded anywhere during the month. East of the Mississippi River monthly totals generally exceeded 2 inches, and ranged up to 10 inches or more at a few stations in the central Mississippi Valley, in the extreme Southeast, and along the north Atlantic Coast. The greatest monthly total in the East, 11.48 inches, was measured at Baltic, Conn., and the greatest 1-day total for the United States, 7.57 inches, was measured at Brooksville, Fla., on the 16th. Precipitation was generally well distributed through the months. There were no serious floods, although minor overflows occurred in New England and Kentucky during periods of heaviest rainfall, and there was some minor flooding in Missouri as a result of melting snow. In West Virginia, Virginia, and the Carolinas, the precipitation was ample to relieve the prolonged dry conditions which had prevailed in portions of those States. Most precipitation in the far West fell during the first few days of the second and third decades. East of the Rocky Mountains general precipitation spread over the area during the first week, about the middle of the month, and again about the middle of the third decade.

Precipitation was generally below normal in the Great Plains. Except in the eastern portions of Texas, Oklahoma, and Kansas, monthly totals were less than 0.05 inch. The greatest deficiencies were in the extreme northern and southern portions, some sections receiving less than 25 percent of normal. The deficiency was more serious in the southern portion where a prolonged period of deficient precipitation prevailed prior to November. At Brownsville, Tex., the monthly total was only 0.20 inch, 2.08 inches below normal. At Dallas, Tex., the monthly total was nearly 2 inches below normal; the accumulated deficiency at Dallas since January 1, 1951, was 6.04 inches.

Snowfall was much above normal in a belt running from eastern Colorado to the Mississippi River and extending northward and northeastward through most of the Lake Region and northeastern interior. Extreme totals for the month ranged up to more than 20 inches in the central Great Plains, more than 40 inches in the Lake Region, and over 30 inches in the northeastern mountains. The average snowfall for Michigan, Illinois, Missouri, and Oklahoma of 16.7, 7.9, 8.0, and 3.8 inches, respectively, set new November records.

The outstanding snowstorm of the month occurred from the 5th to 7th, leaving 10 inches or more of snow on the ground in parts of eastern Kansas, eastern Oklahoma, southern and central Missouri, central Illinois, northern Indiana, and Lower Michigan. In southern Missouri, depths ranged up to 20 inches, and many stations reported new November records for 24-hour amounts and depths on the ground. In St. Louis, Mo. traffic and normal activities were either halted or greatly hampered. Snowfall was heavy in western New York during the first 5 days, accumulating to 28 inches near Buffalo on the 5th. On the 26th general snowfall in New England ranged from 2 to 17 inches. Most of the heavy snowfall melted at lower levels during the brief warm periods, and at the end of the month snow on the ground was generally confined to the mountainous areas in the far West and Northeast except for a light cover in extreme southeastern North Dakota and southwestern Minnesota.

Severe storms were fewer than usual. More deaths and injuries were caused by accidents due to snow and ice than from any other cause. Snow and ice also caused considerable damage. In Minnesota clinging snow damaged overhead wires to the extent of $250,000 on the 13th and 14th. An ice jam at Minneapolis caused an overflow that resulted in a million dollars damage. High winds did considerable damage in eastern and southern New England on the 1st and 3d. General high winds in Washington and Oregon on the 10th and 11th caused widespread minor damage and locally heavy damage to power and communication lines. From the 13th through the 15th, during the passage of a cold front across the central interior, tornadoes occurred in Illinois, Kentucky, Tennessee, and Alabama, causing one death, several injuries, and damage totaling near a quarter million dollars.

The cold, wet weather was unfavorable for drying and picking corn; much was too moist for safe cribbing. In Iowa the crop was only three-fourths gathered at the end of the month, while normally the entire crop would have been gathered by the middle of the month. In Southern States early frost slowed growth and caused extensive light to moderate damage. In parts of the lower Great Plains winter grains needed more moisture. Citrus and winter vegetable crops in Florida, southern Arizona, and southern California were satisfactory.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1

NOVEMBER 1951

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F	°F		°F			°F		In.	In.		In.		In.
Alabama	49.5	-4.7	Demopolis Lock 4	89	1	Valley Head	11	†19	3.62	+0.18	Geneva	10.38	Hayneville	0.40
Arizona	48.7	-1.1	Yuma WB AP	[illegible]	8	Fort Valley	-11	26	.90	+.19	Mt. Lemmon	4.25	Wellton	.01
Arkansas	45.0	-6.2	Malvern	89	14	Harrison	9	19	5.13	+1.33	Saint Francis	10.49	Cummins Farm	1.78
California	51.4	-.6	Indio US Date Garden	94	6	Big Bear Lake Dam	-9	26	3.27	+1.23	Upper Mattole	19.74	3 Stations	.00
Colorado	32.1	-2.8	Two Buttes 1NW	77	7	Dillon 1S	-36	17	.89	+.06	Wolf Cr Pass 4W	7.35	Ovid	.04
Connecticut	38.4	-2.5	Putnam	69	3	Cream Hill	2	28	7.34	+3.49	Baltic	11.48	Salisbury	5.04
Delaware	43.5	-3.2	Lewes	76	16	Del. City Reedy Pt.	12	28	6.47	+3.52	Dover	7.88	Lewes	4.64
Florida	63.3	-1.7	2 Stations	92	2	Marianna Ind School	23	18	4.10	+1.88	Monticello	9.61	Lake Trafford	.00
Georgia	51.7	-3.5	Cuthbert	91	1	Blairsville Exp Sta	9	20	4.10	+1.42	Americus	9.36	Decatur	1.21
Idaho	33.1	-2.2	2 Stations	68	†7	Obsidian 4NNE	-20	16	1.82	-.13	Wallace	5.88	Hamer 4NW	.11
Illinois	35.5	-6.7	East Saint Louis	77	13	Freeport	-2	5	3.43	+.81	Glendale Exp. Farm	8.04	White Hall 1E	1.13
Indiana	35.3	-6.9	Tell City Power Pl	72	12	2 Stations	5	3	4.17	+1.15	Leavenworth Dam 44	6.73	Goshen CAA AP	2.01
Iowa	31.0	-6.4	Winterset	73	10	Decorah	-9	5	1.30	-.42	Washington	3.75	Storm Lake 2E	.22
Kansas	38.8	-5.0	2 Stations	76	+12	2 Stations	-4	2	1.02	-.37	Oswego	5.14	Lucerne	T
Kentucky	40.4	-5.9	Pikeville	79	13	Shelbyville 2W	6	3	6.86	+3.34	Munfordville	10.96	Pikeville	3.18
Louisiana	54.8	-3.5	2 Stations	89	†14	Colfax	12	3	2.73	-1.39	Oak Ridge	5.63	Alexandria	.94
Maine	33.3	-1.8	Old Town	68	†3	Lac Frontier	-9	28	6.49	+2.86	Belfast	10.44	Caribou WB AP	3.92
Maryland	42.1	-3.1	Cumberland Pol.Brks.	80	14	Oakland	-7	21	5.38	+2.68	Emmitsburg	7.45	Luke	2.77
Massachusetts	39.1	-1.9	Provincetown 2WNW	77	7	3 Stations	2	28	6.51	+2.81	Lake Cochituate	8.93	Nantucket WB	3.77
Michigan	29.2	-6.8	3 Stations	62	†13	Watersmeet	-19	6	2.77	+.25	Detour	4.51	L'Anse	.79
Minnesota	22.9	-6.5	Tracy Power Plant	62	12	Itasca State Park	-19	24	1.21	+.03	Mankato	2.61	Pipestone	.20
Mississippi	50.4	-4.7	2 Stations	86	†1	2 Stations	13	19	3.29	-.54	Hernando	8.20	Brookhaven	.91
Missouri	38.4	-6.2	3 Stations	78	†13	Black 6NW	-4	8	3.75	+1.02	Sikeston	9.76	Lathrop 3SW	.87
Montana	29.6	-2.2	2 Stations	64	†28	Summit	-30	1	.54	-.31	Glacier Park	4.88	2 Stations	.00
Nebraska	34.7	-2.6	Valentine Lakes Game	76	20	Fort Robinson	-10	2	.34	-.45	Falls City	2.00	do	.00
Nevada	39.1	-1.5	Sarcobatus	88	4	2 Stations	-6	†2	.78	+.11	Marlette Lake	3.28	Beatty	.00
New Hampshire	32.9	-2.5	Windham	71	14	3 Stations	-10	28	5.81	+2.41	Nashua 3N	8.83	Whitefield	3.23
New Jersey	40.3	-2.8	Chatsworth 5S	75	16	Layton 3NW	3	28	6.81	+3.41	Phillipsburg	8.48	Chatsworth	5.14
New Mexico	41.4	-1.5	Diamond T Ranch	90	1	Maxwell	-19	2	.42	-.19	Chacon	2.97	7 Stations	.00
New York	33.2	-5.0	N.Y. Westerleigh	71	14	2 Stations	-14	28	4.54	+1.41	Lake Ronkonkoma	9.05	Dannemora	2.18
North Carolina	46.6	-3.4	6 Stations	83	†14	Mt. Mitchell	-1	19	3.71	+.91	Clingmans Dome	8.86	Lumberton	1.22
North Dakota	21.8	-5.6	McLeod	59	11	Forman	-24	24	.28	-.33	Grassy Butte 10W	1.34	2 Stations	T
Ohio	36.4	-5.1	Irontown	79	13	Apco Ravena Arsenal	2	21	4.14	+1.39	Chardon	6.51	New Lexington 1N	1.69
Oklahoma	44.4	-5.5	Bixby	88	12	Kenton	-9	2	2.17	+.14	Hollow	9.72	Kenton 6N	.12
Oregon	39.4	-.8	Powers	80	5	Seneca	-14	16	4.27	+.39	Illahe	17.62	Plush	.41
Pennsylvania	36.1	-5.2	Donora	77	13	Lawrenceville 1S	-7	21	5.06	+2.07	Pimple Hill	8.83	Breezewood	1.80
Rhode Island	41.8	-1.3	Providence WB City	70	14	Greenville	10	28	8.20	+4.42	Greenville	9.88	Block Island	6.54
South Carolina	50.0	-3.9	2 Stations	87	1	Union 7SW	10	20	2.90	+.55	Caesars Head	7.54	Dillon 4SW	1.56
South Dakota	29.6	-3.5	Wood	72	11	Custer	-16	2	.25	-.41	Dumont	1.76	3 Stations	.00
Tennessee	43.2	-5.2	2 Stations	77	†13	Gatlinburg 2SW	8	20	6.08	+2.37	Perryville	10.52	Memphis WB AP	2.89
Texas	53.2	-2.5	Encinal	97	1	Stratford	2	2	.87	-.97	Waller	4.33	18 Stations	.00
Utah	34.1	-3.0	2 Stations	75	†4	Scofield Dam	-22	26	1.42	+.49	Silver Lake Bright.	6.35	Mt. Emmons	.11
Vermont	30.9	-3.9	do	67	14	West Burke	-12	28	4.58	+1.34	Mays Mill	7.17	Rutland	3.52
Virginia	42.6	-4.2	Glenns 1S	83	17	Burkes Garden	7	21	4.63	+2.08	Norfolk WB AP	7.01	Front Royal CAA AP	2.78
Washington	38.6	-1.3	2 Stations	77	†5	Bumping Lake	5	16	4.44	-.24	Spruce	22.71	Richland 2NW	.71
West Virginia	38.1	-5.1	3 Stations	79	†13	Canaan Valley	-10	21	4.31	+1.46	Point Pleasant	6.44	Athens	2.17
Wisconsin	25.6	-7.4	Reedsburg	68	12	Danburg	-15	6	1.91	+.02	Kenosha	4.03	Gordon	.90
Wyoming	29.0	-2.4	2 Stations	70	†10	Bondurant	-36	16	.47	-.31	Snake River	2.28	7 Stations	.00
Alaska ‡	52.6	+1.5	Moose Valley	91	10	Central	23	26	3.78	-.66	Little Port Walter	12.45	Circle Hot Springs	.38
Hawaii *	74.4	+.4	Puunene	95	†4	Haleakala RS	42	14	9.49	+3.86	Olaa	32.00	Ahua Umi	.70
Puerto Rico	76.6	+.7	Guayama	95	8	Maricao Fish Hatchery	47	1	5.04	-1.96	Maricao Fish Hatchery	11.20	Santa Rita	.70

† Other dates also.
‡ August 1951.
* October 1951.

CLIMATOLOGICAL DATA

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)				
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0-3	4-7	8-10	0-10	%
ALABAMA																																
Birmingham	610	996.3	1022.0	59	36	47.8	-3.6	76	13	21	19	0	15	37	72	1.98	-1.33	0.73	9	1	T	0	9.2	SSE	35	S	†13	11	4	15	6.0	51
Mobile CO	10	-----	------	65	44	54.4	-4.1	80	26	26	18	0	3	--	--	3.80	+.16	2.55	7	2	.0	0	10.9	---	42	SE	13	10	9	11	5.4	66
Mobile	211	1013.2	1021.3	66	42	54.0	----	80	15	25	18	0	8	43	73	3.99	-----	3.11	7	3	.0	0	10.6	N	--	---	-	11	12	7	5.4	--
Montgomery CO	201	------	------	62	40	50.9	-4.9	80	15	27	18	0	7	--	--	2.51	-.72	.93	7	0	.0	0	----	---	--	---	--	-	--	--	---	--
Montgomery	198	1014.2	1021.9	63	37	49.9	-5.9	81	15	24	18	0	12	40	75	2.47	-.76	.96	6	T	.0	0	6.5	NNW	30	NW	6	10	8	12	5.3	58
ARIZONA																																
Flagstaff	6993	787.7	1021.6	48	20	34.1	----	65	4	-1	25	0	28	21	64	1.26	-----	.84	6	0	11.9	11	8.5	SW	--	---	--	18	4	8	3.7	--
Payson CO	5000	849.6	1018.9	59	33	46.1	----	72	4	20	25	0	11	30	59	2.55	-----	1.74	5	0	T	T	4.1	NE	--	---	--	18	4	8	3.7	--
Phoenix CO	1083	------	------	73	47	60.1	+.4	81	9	37	25	0	0	--	--	.84	+.14	.79	3	0	.0	0	5.5	---	27	NE	17	--	--	--	---	86
Phoenix	1108	977.0	1016.4	73	44	58.6	----	82	7	35	25	0	0	42	60	.73	+.03	.70	2	0	.0	0	3.8	SE	--	---	--	19	3	8	3.2	--
Prescott	5014	848.6	1019.1	58	30	44.0	----	73	4	19	26	0	20	26	54	.42	-----	.33	5	0	.3	T	7.5	SW	23	W	20	19	3	8	3.6	73
Tucson	2558	927.2	1015.9	71	46	58.5	+.8	80	30	35	27	0	0	38	53	1.27	+.45	.71	4	0	.0	0	6.9	SE	55	E	17	17	9	4	3.5	87
Winslow	4880	853.7	1019.4	55	29	41.6	.0	71	4	17	17	0	20	20	49	.41	-.20	.32	3	0	T	0	6.2	SW	†35	SW	12	19	3	8	3.6	--
Yuma	203	1010.5	1015.8	77	51	64.0	----	89	8	39	25	0	0	35	41	.10	-----	.09	2	0	.0	0	7.1	NNE	33	NE	16	25	2	3	1.8	91
ARKANSAS																																
Fort Smith	458	1003.7	1020.9	55	36	45.4	-5.6	80	12	20	19	0	12	34	71	4.00	+1.13	1.29	12	2	2.7	2	9.3	NE	32	SW	12	12	6	12	5.5	41
Little Rock	257	1007.8	1021.2	55	37	46.0	-6.1	83	13	20	19	0	13	35	72	4.35	+.16	2.15	11	1	.4	0	9.7	S	29	S	13	8	8	14	6.4	47
Texarkana	361	1007.5	1020.9	60	40	49.9	-5.1	84	13	21	18	0	9	40	76	2.03	-2.27	1.26	7	1	T	0	9.8	SSE	40	WNW	5	9	7	14	5.8	76
CALIFORNIA																																
Bakersfield	489	1000.0	1018.3	70	44	56.9	+1.5	85	5	34	25	0	0	39	56	.33	-.13	.25	4	0	.0	0	4.2	ENE	†30	SE	19	15	6	9	3.9	--
Beaumont CO	2589	926.9	1017.7	65	43	53.8	----	84	4	29	25	0	2	28	46	.79	-----	.53	6	1	.0	0	9.5	E	†30	E	16	16	7	7	3.7	--
Bishop	4108	875.4	1017.6	62	27	44.6	----	81	4	15	18	0	25	--	--	.87	-----	.85	2	0	T	T	----	---	--	---	--	14	10	6	3.9	--
Blue Canyon	5280	839.1	1017.2	49	36	42.9	----	69	5	25	22	0	11	29	65	13.66	-----	3.27	13	0	34.0	27	11.2	SE	--	---	--	9	5	16	6.0	--
Burbank	699	990.5	1016.7	71	47	58.9	----	86	6	36	24	0	0	40	58	1.06	-----	.88	3	1	.0	0	3.5	S	†21	NE	16	17	7	6	3.6	--
Eureka CO	43	1014.9	1017.3	58	46	52.0	+.9	71	17	36	23	0	0	--	--	7.80	+2.62	1.63	15	0	.0	0	7.4	---	31	S	18	4	6	20	7.7	26
Fresno	331	1006.4	1018.3	69	42	55.5	+3.1	85	6	32	23	0	1	44	73	1.03	+.10	.82	3	0	.0	0	5.3	NW	21	SE	20	13	9	8	4.4	83
Los Angeles CO	312	------	------	71	53	61.9	+1.0	86	6	44	24	0	0	--	--	1.29	+.09	1.16	2	0	.0	0	5.8	---	24	SW	20	16	7	7	3.6	72
Los Angeles	99	1013.2	1016.9	71	51	60.8	----	86	2	43	24	0	0	47	69	.71	-----	.64	3	0	.0	0	3.6	WSW	--	---	--	17	8	5	3.6	--
Mt. Shasta CO	3543	893.3	1018.3	50	31	40.5	-.9	72	5	21	24	0	18	32	74	9.86	+5.87	2.77	12	0	7.8	4	8.6	SE	†24	ESE	11	9	2	19	6.6	--
Oakland	3	1017.6	1018.2	64	47	55.2	+2.8	79	4	38	23	0	0	47	78	3.22	+1.16	1.13	10	0	.0	0	4.7	SE	--	---	--	8	5	17	6.3	--
Red Bluff	341	1004.7	1017.5	62	44	53.1	-.7	82	4	31	24	0	1	41	69	4.21	+1.24	1.30	12	0	.0	0	7.7	NNW	42	SE	11	9	4	17	6.6	53
Sacramento CO	25	------	------	--	--	----	----	--	--	--	--	-	--	--	--	-----	-----	----	--	-	---	--	----	---	--	---	--	--	--	--	---	--
Sacramento	17	1016.6	1017.6	64	43	53.7	+.1	77	5	35	23	0	0	47	81	2.85	+.97	1.49	10	2	.0	0	8.7	SE	42	SE	19	11	4	15	5.9	52
Sandberg CO	4517	863.5	1017.6	55	41	47.5	----	73	4	29	24	0	3	25	51	.56	-----	.47	4	0	T	0	20.0	NE	--	---	--	15	8	7	4.0	--
San Diego	19	1012.9	1016.5	70	53	61.6	+2.3	85	2	43	25	0	0	49	69	1.23	+.47	.62	7	0	.0	0	4.6	N	16	SW	22	18	8	4	3.3	76
San Francisco CO	52	------	------	62	50	56.3	.0	77	5	45	23	0	0	--	--	3.33	+.98	1.00	11	0	T	0	7.0	---	26	S	19	9	3	18	6.9	48
San Francisco	1	1016.9	1017.8	63	46	54.1	+1.8	77	5	39	23	0	0	49	83	2.56	+1.00	.76	10	0	T	0	7.9	WNW	36	S	19	8	7	15	6.2	--
Santa Catalina	1568	960.4	1016.3	65	51	58.1	----	78	6	45	23	0	0	--	--	.58	-----	.29	6	0	.0	0	----	---	--	---	--	14	9	7	3.9	-
Santa Maria	231	1009.5	1018.0	68	44	56.1	----	86	3	33	23	0	0	44	70	.99	-----	.55	3	0	.0	0	7.4	E	†29	NNE	15	20	5	5	3.1	--
COLORADO																																
Alamosa	7534	771.7	1024.1	43	8	25.7	----	57	4	-7	17	0	30	--	--	.22	-----	.09	4	0	4.2	2	----	---	--	---	--	17	8	5	3.6	--
Colorado Springs	6175	809.3	1020.2	50	23	36.1	----	67	30	-8	2	0	28	14	46	.53	-----	.40	4	0	5.9	4	9.3	N	†36	WNW	13	16	7	7	4.0	--
Denver	5292	837.1	1017.6	52	25	38.1	+.3	65	10	-6	2	0	23	18	49	1.17	+.51	.54	6	0	14.5	6	7.8	S	39	NW	13	12	13	5	4.0	75
Grand Junction	4849	862.2	1022.2	46	26	36.2	-3.1	60	11	14	2	0	28	21	58	.25	-.32	.14	5	0	1.7	1	7.2	ESE	45	NW	12	13	7	10	5.1	63
Pueblo	4799	856.8	1019.3	53	21	36.7	-1.6	69	30	-6	2	0	29	21	60	1.05	+.69	.45	5	0	14.1	4	6.8	WNW	50	NW	12	15	5	10	4.2	66
CONNECTICUT																																
Bridgeport	7	1018.6	1019.3	50	32	41.2	----	66	7	16	28	0	15	30	67	6.38	-----	2.11	9	0	T	0	10.4	NE	†30	E	7	11	[illegible]	11	5.9	-
Hartford	15	1012.9	1018.8	48	30	38.9	-.6	67	15	14	28	0	20	28	71	7.36	+3.81	2.67	9	0	.6	1	8.3	NNW	39	NW	26	[illegible]	[illegible]	[illegible]	6.6	47
New Haven	6	1014.2	1018.3	49	32	40.4	+.5	65	7	14	28	0	15	--	--	7.79	+4.74	2.86	11	0	.1	T	8.0	---	38	SE	7	8	8	14	6.3	52
DELAWARE																																
Wilmington	73	1016.6	1019.8	51	32	41.5	----	71	14	17	28	0	16	31	69	7.32	-----	2.32	9	1	T	T	8.7	NW	--	---	--	8	5	17	6.6	--
FLORIDA																																
Apalachicola CO	13	1019.0	1020.3	65	49	57.0	-4.3	81	1	32	18	0	1	--	--	3.70	+.63	1.47	6	4	.0	0	8.8	---	25	NW	3	13	10	7	4.8	60
Daytona Beach	33	1018.3	1019.7	73	53	63.3	-2.4	88	2	34	19	0	0	55	80	3.15	+.68	2.37	7	3	.0	0	9.6	NW	†27	NNW	29	7	10	13	6.2	--
Fort Myers	15	1018.3	1018.7	77	57	67.1	-2.4	88	1	39	19	0	0	57	77	1.14	-.19	.69	6	2	.0	0	8.9	NE	†26	NW	3	8	11	11	5.9	-
Jacksonville CO	18	------	------	68	50	58.9	-3.3	82	1	32	18	0	1	--	--	2.17	+.19	.95	8	-	.0	0	----	---	--	---	-	--	--	--	---	-
Jacksonville	52	1019.6	1020.0	69	48	58.2	-2.3	85	1	30	19	0	2	49	78	2.28	+.30	.84	9	2	.0	0	7.2	NW	25	SE	15	10	7	13	5.9	63
Key West CO	5	1016.6	1017.3	79	69	74.1	-.2	86	‡1	57	19	0	0	--	--	3.68	+1.49	3.09	3	1	.0	0	9.3	N	33	NW	17	9	8	13	5.8	64
Key West	6	1016.9	1017.3	78	68	73.0	-.6	87	‡1	55	19	0	0	65	78	2.84	+.65	2.02	4	2	.0	0	13.7	NNE	--	---	--	9	9	12	5.7	--
Lakeland CO	214	------	------	73	54	63.5	-3.6	86	1	35	18	0	0	--	--	3.88	+2.04	3.34	7	3	.0	0	----	NE	--	---	--	11	10	9	5.3	--
Melbourne	22	1018.3	1019.1	75	57	66.0	-1.4	88	2	40	18	0	0	58	80	4.19	+2.18	3.28	6	2	.0	0	10.1	NW	†25	NW	3	6	14	10	6.1	--
Miami CO	180	------	------	77	65	70.8	-1.7	85	7	43	19	0	0	--	--	.67	-2.58	.23	7	0	.0	0	13.2	N	34	N	17	7	14	9	6.0	56
Miami	9	1016.6	1017.0	79	63	71.0	----	87	7	44	19	0	0	61	74	.54	-----	.24	5	0	.0	0	9.2	NNW	†34	NNW	3	4	16	10	6.2	--
Miami Beach	3	------	------	78	67	72.7	----	88	7	46	19	0	0	--	--	.51	-----	.22	5	-	.0	0	----	---	--	---	--	17	3	10	---	--
Orlando	111	1015.6	1019.9	74	53	63.7	-2.7	88	2	35	18	0	0	55	78	4.86	+3.19	4.03	6	3	.0	0	10.2	N	†35	SSW	16	9	8	13	5.8	--
Pensacola CO	13	1018.6	------	65	46	55.5	-4.7	83	15	27	18	0	4	--	--	4.86	+1.16	2.73	6	3	.0	0	7.9	---	25	N	17	13	9	8	4.8	73
Pensacola CAA AP	110	------	1020.9	--	--	-----	----	--	--	--	--	-	-	46	--	----	-----	----	-	-	- -	-	8.4	N	--	---	-	--	--	--	---	--
Tallahassee	64	1018.6	1021.0	68	45	56.5	----	82	14	29	18	0	5	46	76	8.44	-----	3.99	7	5	.0	0	5.9	NNW	--	---	--	11	7	12	5.4	--
Tampa	24	1018.3	1019.7	75	55	64.6	-2.3	85	2	37	18	0	0	55	77	3.68	+1.96	2.93	6	3	.0	0	7.5	NNE	26	S	2	9	9	12	5.6	61
West Palm Beach	14	1017.3	1017.8	80	62	71.0	----	89	2	43	19	0	0	61	76	.67	-2.79	.30	7	2	.0	0	9.1	ENE	--	---	--	3	14	13	6.7	--
GEORGIA																																
Albany	190	1014.6	1021.7	66	42	53.8	-4.6	81	14	27	18	0	7	43	72	4.90	+2.43	1.94	6	2	.0	0	5.2	NE	--	---	--	11	4	15	5.4	--
Atlanta CO	1054	------	------	55	38	46.6	-5.5	71	11	24	19	0	10	--	--	2.02	-1.01	.65	-	-	---	-	----	---	--	---	-	--	--	--	---	--
Atlanta	977	978.7	1021.5	57	38	47.5	-4.0	71	1	25	19	0	8	35	69	2.63	-.48	1.00	7	1	T	0	9.0	NNW	36	SW	‡1	9	9	12	6.5	54
Athens	798	991.5	------	57	36	46.4	----	72	24	21	20	0	15	--	--	1.88	-----	.50	8	0	T	0	----	---	-	---	--	11	3	16	6.2	--
Augusta	426	1014.6	1021.2	63	37	50.2	-4.8	79	14	19	21	0	12	41	79	2.45	-.03	1.34	10	2	.0	0	5.8	NW	†25	WNW	3	11	5	14	5.6	--
Columbus	382	1007.1	1021.5	63	38	50.4	----	80	15	26	9	0	12	40	75	2.52	-----	.86	7	0	.0	0	7.5	NW	--	---	--	12	4	14	5.5	--
Macon	354	1007.1	1020.9	64	39	51.8	----	78	13	24	21	0	9	39	70	4.19	-----	1.06	7	3	.0	0	9.3	NW	27	SE	1	12	3	15	5.5	67
Rome	637	998.3	1022.0	58	33	45.3	----	72	‡11	17	20	0	16	35	74	3.88	-----	1.16	10	2	T	0	8.2	N	--	---	--	8	8	14	6.2	--
Savannah	38	1018.6	1021.0	65	43	54.1	-2.7	82	14	24	21	0	7	44	76	3.25	+1.15	2.37	8	2	.0	0	7.8	NE	33	NW	3	10	4	16	5.6	50
Valdosta	200	1012.5	1020.7	68	44	55.6	-3.8	82	25	28	19	0	6	45	--	6.06	+4.16	3.15	8	2	.0	0	8.2	NE	--	---	--	10	9	11	5.6	--
IDAHO																																
Boise	2842	922.1	1020.1	48	30	38.7	-1.0	62	9	17	1	0	19	29	70	1.80	+.52	.45	14	0	T	T	8.0	SE	36	W	10	6	2	22	7.5	42
Lewiston	1413	966.1	1018.4	47	31	39.3	----	57	30	19	1	0	19	33	79	.67	-----	.18	10	0	T	T	5.1	E	--	--	--	2	4	24	8.5	--
Pocatello	4444	864.2	1020.9	45	22	33.6	-.5	58	9	3	17	0	25	22	64	.36	-.67	.21	5	0	1.7	2	8.9	S	42	SW	12	7	10	13	6.3	37
ILLINOIS																																
Cairo CO	314	1007.8	1021.3	50	35	42.1	-5.2	70	13	20	3	0	14	--	--	8.02	+4.34	3.07	12	2	1.0	T	10.1	---	37	SW	13	6	5	19	7.1	45
Chicago	618	995.6	1019.1	40	26	32.9	-4.8	64	13	11	5	0	25	23	72	3.74	+1.23	1.19	9	1	13.0	8	10.4	SSW	40	NW	3	7	7	16	6.9	48
Joliet	580	997.0	1019.1	40	23	31.4	-7.3	65	13	8	5	0	27	25	82	3.53	+1.25	1.17	8	1	8.9	7	13.0	S	--	---	--	7	7	16	6.5	--
Moline	589	997.0	1019.8	42	24	32.6	-4.9	67	13	11	4	0	26	23	74	1.68	-.14	.68	7	2	3.4	3	11.9	NW	57	W	3	7	9	14	6.7	50
Peoria	659	997.0	1019.8	42	24	33.3	-6.5	69	13	10	8	0	26	25	76	2.43	-.06	1.24	9	3	8.7	8	12.8	S	49	W	3	6	9	15	6.5	49
Springfield CO	----	------	------	--	--	----	----	--	-	--	--	-	--	--	--	-----	-----	----	--	-	---	-	----	---	-	---	--	--	--	--	---	--
Springfield	598	995.9	1020.0	43	27	35.0	-4.9	72	13	6	8	0	24	27	75	2.25	-.27	.80	9	2	9.4	8	15.2	S	57	S	12	7	5	18	6.6	49

See footnotes at end of table.

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA																																
Evansville	385	1005.1	1021.3	48	30	39.0	-5.4	68	11	13	3	0	22	30	76	5.73	+1.99	1.73	13	3	2.1	2	11.3	S	38	S	13	7	6	17	6.9	40
Fort Wayne	801	986.8	1019.0	41	26	33.7	-5.1	61	13	13	3	0	24	27	82	2.73	-.15	1.09	11	2	5.3	2	10.7	SW	52	SW	13	2	16	12	7.2	49
Indianapolis	796	989.8	1020.2	44	28	35.6	-5.1	62	13	11	3	0	21	28	79	5.21	+1.86	1.77	12	1	4.0	3	13.6	SSW	43	SW	14	5	10	15	7.0	36
South Bend	768	989.8	1018.8	39	25	32.0	-8.1	62	13	7	3	0	25	26	79	4.00	+1.29	1.32	14	2	23.4	10	13.0	SSW	†38	SW	14	1	11	18	7.8	--
Terre Haute	585	999.0	1020.9	44	27	35.7	-6.7	64	13	10	3	0	22	27	76	3.89	+.58	1.64	11	1	7.7	6	10.1	S	38	S	13	7	5	18	7.0	37
IOWA																																
Burlington	605	993.2	1019.7	44	25	34.1	-4.5	70	13	11	4	0	26	24	74	1.74	-.33	.59	6	4	3.3	2	12.1	NW	47	W	3	4	12	14	7.1	66
Charles City CO	1013	982.1	1020.3	37	19	27.9	-5.1	60	10	-1	24	0	28	--	--	1.23	-.30	.47	8	2	6.2	3	6.9	---	31	SE	11	10	6	14	5.9	46
Davenport CO	579	997.0	------	41	26	33.5	-5.5	66	13	11	4	0	24	--	--	1.99	+.17	.77	7	2	4.7	4	----	---	--	---	--	--	--	--	---	--
Des Moines	800	987.5	1019.8	42	23	32.2	-6.2	67	12	8	24	0	25	22	72	1.81	+.38	1.43	6	1	.6	T	12.2	NW	63	NW	3	9	7	14	6.1	47
Dubuque	641	978.0	1018.5	37	20	28.3	----	60	10	0	5	0	26	20	79	2.57	-----	1.05	6	3	3.2	1	12.4	SSW	†45	WSW	14	7	7	16	6.4	--
Sioux City	1097	976.6	1018.9	41	20	30.4	-3.6	65	12	4	26	0	27	20	70	.41	-.59	.33	4	0	4.6	4	9.7	SSE	47	NW	3	6	12	12	6.7	62
KANSAS																																
Concordia CO	1375	968.2	1019.3	48	28	38.1	-3.3	70	10	15	2	0	20	--	--	.31	-.68	.20	3	0	T	T	7.8	---	29	NW	3	6	9	15	6.5	57
Dodge City	2594	928.9	1018.9	51	27	38.6	-4.0	70	20	8	2	0	23	37	74	.63	-.10	.32	3	0	6.1	4	13.4	S	36	NW	13	13	11	6	4.6	71
Goodland	3645	888.6	1018.3	51	21	36.1	-4.4	70	8	-4	2	0	29	21	68	.61	-.01	.19	5	0	4.9	2	11.2	SW	†30	NW	13	15	5	10	4.6	--
Topeka	926	983.4	1020.2	48	28	38.2	----	70	10	15	18	0	22	28	75	1.35	----	.93	5	2	T	T	10.3	N	42	N	3	7	8	15	6.5	52
Wichita	1372	969.9	1019.7	48	31	39.5	-5.3	64	21	18	18	0	17	31	76	1.47	+.08	.83	6	0	8.1	7	13.6	S	37	NW	16	10	8	12	5.7	53
KENTUCKY																																
Lexington	979	984.4	1021.2	48	29	38.4	-6.4	70	13	12	3	0	22	27	69	6.87	+3.53	1.82	12	2	2.8	1	13.1	S	--	---	--	6	7	17	7.0	--
Louisville CO	457	------	------	49	33	40.8	-5.9	72	13	17	3	0	19	--	--	4.27	+.66	1.26	10	1	.6	1	----	---	--	---	--	--	--	--	---	--
Louisville	485	1004.4	1020.9	49	30	39.4	-5.6	71	13	14	3	0	22	29	71	4.17	+.56	1.25	10	1	.7	1	9.5	S	56	W	13	1	14	19	7.1	40
LOUISIANA																																
Baton Rouge	64	1013.9	1020.0	68	43	55.6	-4.5	85	14	27	18	0	7	44	75	2.77	-.82	2.09	5	1	.0	0	7.4	N	--	---	--	13	5	12	5.1	--
Lake Charles	12	1019.6	1020.8	68	47	57.6	-2.2	84	14	29	18	0	3	48	81	2.21	-1.76	1.31	4	2	.0	0	11.8	SE	--	---	--	8	9	13	5.9	--
New Orleans CO	12	1019.0	------	67	49	58.2	-3.4	85	15	34	18	0	0	--	--	3.71	+.57	3.44	5	0	.0	0	7.3	---	22	N	27	10	13	7	4.9	67
New Orleans	12	1019.3	1021.1	67	46	56.8	----	86	15	31	19	0	2	47	78	3.00	-----	2.53	5	2	.0	0	10.7	N	†33	NNW	2	10	9	11	5.1	--
Shreveport	174	1011.5	1021.0	64	40	52.0	-4.5	83	15	21	19	0	9	42	76	2.43	-1.22	.90	10	1	T	T	9.6	SSE	34	W	15	10	5	15	5.5	56
MAINE																																
Caribou	624	992.6	1016.8	35	21	28.0	+.8	63	3	1	22	0	27	22	78	3.93	+1.25	1.23	16	0	24.7	14	11.6	S	†42	SSW	3	1	7	22	8.2	--
Eastport	33	1013.9	1016.9	45	31	38.0	+1.3	63	3	11	28	0	16	--	--	8.18	+4.86	2.26	12	0	3.2	3	12.2	---	47	S	3	5	5	20	7.4	35
Portland	61	1013.5	1017.5	45	26	35.7	-1.6	64	15	9	28	0	24	28	78	8.00	+4.54	3.39	12	0	2.6	2	8.9	W	46	S	3	8	5	17	6.4	47
MARYLAND																																
Baltimore CO	14	------	------	51	37	44.0	-2.3	72	‡14	25	28	0	12	--	--	6.03	+3.47	1.82	--	-	----	--	----	---	--	---	--	--	--	--	---	--
Baltimore	146	1015.9	1020.5	51	32	41.6	----	73	14	15	28	0	16	29	65	6.20	-----	2.39	11	0	T	0	12.0	WNW	48	S	7	10	11	9	6.2	36
Frederick	294	------	------	52	30	41.3	----	71	1	13	21	0	17	--	--	5.41	-----	1.40	11	0	.0	0	----	---	--	---	--	--	--	--	---	--
MASSACHUSETTS																																
Boston	12	1013.2	1017.9	50	35	42.6	+.6	71	3	16	28	0	13	30	64	6.60	+3.27	1.82	12	0	T	T	13.6	WNW	56	SW	3	8	7	15	6.3	49
Nantucket	43	1017.6	1018.0	52	37	44.6	+.2	66	3	23	21	0	8	37	75	3.77	+.55	1.04	12	1	T	0	12.8	NW	49	S	6	6	9	15	6.8	46
Pittsfield	1153	974.6	1018.3	41	24	32.2	-3.8	62	7	3	28	0	25	--	--	5.14	+1.88	1.62	12	0	7.0	3	8.4	---	--	---	--	6	6	18	7.2	--
MICHIGAN																																
Alpena CO	587	993.9	1017.3	35	24	29.6	-4.8	53	14	6	27	0	24	--	--	2.11	-.49	.65	17	0	19.4	10	11.5	---	35	S	12	5	7	18	7.4	31
Detroit	619	990.9	1018.4	41	28	34.6	-4.6	59	13	16	3	0	22	26	75	3.48	+1.04	2.18	13	0	8.3	5	11.8	NW	37	SW	14	5	8	17	7.1	34
Escanaba CO	594	993.6	1016.9	35	21	27.9	-5.2	50	13	6	5	0	26	--	--	1.28	-.85	.51	9	0	5.3	2	12.3	---	47	N	7	5	9	16	6.8	46
Grand Rapids	638	992.2	1018.3	39	24	31.0	-4.8	61	13	6	5	0	25	24	81	3.83	+1.06	1.79	11	1	26.9	12	11.1	SSW	42	W	14	3	9	18	7.7	35
Lansing	859	985.4	1018.5	37	24	30.7	-6.5	58	13	11	5	0	24	24	80	2.63	+.15	1.24	13	1	16.8	11	14.2	W	35	W	26	5	7	18	7.3	32
Marquette CO	677	987.8	1015.6	35	22	28.3	-5.0	57	30	5	3	0	24	--	--	2.06	-.85	.45	11	0	16.3	8	10.1	---	42	S	27	4	4	22	8.1	37
Muskegon	627	994.2	1017.9	38	26	31.8	-7.9	60	13	8	27	0	23	26	79	4.17	+1.76	1.87	14	1	21.5	8	11.4	WNW	†45	SW	14	1	6	23	8.6	--
Sault Ste.Marie	721	992.9	1016.4	34	19	26.7	-3.7	50	14	-5	27	0	25	21	82	2.59	-.42	.87	16	0	13.3	5	9.7	SW	30	SW	14	1	10	19	7.9	28
Ypsilanti	722	989.2	1018.3	41	27	33.5	----	59	13	15	3	0	25	26	78	3.41	-----	2.02	11	0	10.1	8	11.8	SW	†36	SW	14	5	9	16	7.2	--
MINNESOTA																																
Duluth	1128	973.6	1016.5	29	14	21.4	----	49	29	-5	24	0	29	15	78	1.37	-----	.99	13	0	2.9	5	11.4	NW	45	NW	26	6	11	13	6.8	42
Intern'l. Falls	1179	971.2	1016.6	27	11	18.8	-6.3	49	12	-14	24	0	30	15	84	1.10	+.10	.49	13	0	9.6	8	----	---	--	---	--	3	9	18	7.4	--
Minneapolis	830	983.4	1018.5	34	18	25.6	-6.8	59	12	-6	24	0	28	18	76	2.12	+.85	1.42	7	2	10.8	4	11.0	SE	39	N	3	5	10	15	6.8	38
Rochester	1014	980.4	1018.7	34	15	24.8	-7.9	57	12	-5	24	0	28	20	83	1.80	+.26	.86	9	2	8.6	4	10.9	NW	--	---	--	9	3	18	6.6	--
St. Cloud	1034	978.0	1017.7	32	13	22.5	-8.2	53	12	-9	24	0	30	17	82	1.54	+.32	1.17	8	0	3.9	4	7.9	WNW	--	---	--	7	8	15	6.3	--
St. Paul	703	990.5	1017.9	34	18	26.1	-6.4	61	12	-4	24	0	28	19	78	2.47	+1.17	1.62	10	2	11.3	3	9.0	SSE	†30	SE	3	5	7	18	7.0	--
MISSISSIPPI																																
Jackson	315	1009.5	1021.6	64	39	51.3	-4.5	82	15	20	18	0	12	39	68	1.59	-1.82	.72	8	1	T	0	8.9	SSE	51	S	13	12	4	14	5.2	59
Meridian	294	1007.8	1021.6	64	37	50.4	-1.4	82	15	19	19	0	13	39	72	1.29	-2.03	.65	5	1	.0	0	6.5	NW	--	---	--	13	4	13	5.1	--
Vicksburg CO	234	1014.2	------	62	43	52.5	-4.1	81	15	25	18	0	7	--	--	1.74	-1.97	.50	10	0	T	0	9.8	---	30	SW	13	9	8	13	5.5	57
MISSOURI																																
Columbia	733	990.5	1020.0	47	29	38.1	-4.6	72	12	13	8	0	19	27	70	1.94	-.26	.97	5	3	7.5	8	11.5	S	46	NW	3	9	5	16	6.5	46
Kansas City	741	984.1	1020.1	48	31	39.7	-4.0	70	12	19	4	0	17	28	68	1.00	-1.22	.71	7	2	.3	T	9.9	SSW	48	NW	3	10	2	18	6.5	65
St. Joseph	809	983.7	1019.6	47	27	37.0	-4.5	69	12	17	18	0	24	27	74	2.17	+.59	1.93	5	2	.1	T	10.8	SSE	44	W	3	10	4	16	5.9	52
St. Louis CO	465	993.9	------	47	32	39.4	-6.0	74	13	19	8	0	17	--	--	3.33	+.50	1.26	9	2	12.7	12	13.2	---	56	SW	13	8	5	17	6.3	53
St. Louis	465	993.9	1020.5	47	30	38.8	-5.1	76	13	15	8	0	18	28	71	2.60	+.20	1.18	9	2	11.3	10	10.1	NW	--	---	--	7	7	16	6.7	--
Springfield	1265	971.6	1020.2	47	29	38.0	-7.0	73	12	10	8	0	17	30	77	4.36	+1.57	1.34	11	1	19.5	14	14.1	SSE	54	SW	13	9	6	15	6.5	41
MONTANA																																
Billings	3568	889.6	1016.4	45	25	35.2	-.2	61	30	7	1	0	22	20	57	.16	-----	.07	6	0	2.8	2	11.0	WSW	37	NW	4	4	15	11	6.4	47
Butte	5530	828.0	1020.9	39	15	26.7	-2.6	54	7	-2	16	0	30	17	69	.40	.00	.18	8	0	5.2	3	7.6	S	--	---	--	2	4	24	8.2	--
Glasgow CO	2090	940.1	1017.0	37	17	27.2	-.5	57	29	-4	2	0	30	20	77	.48	-.02	.26	6	0	5.9	6	----	---	--	---	--	3	4	23	8.4	--
Great Falls	3664	885.9	1015.1	44	28	35.5	-.6	59	10	7	1	0	17	22	60	.41	-.27	.22	8	0	4.3	4	15.4	SW	63	SW	25	1	8	21	8.0	39
Havre CO	2488	924.8	1016.3	40	22	30.9	-.3	57	30	1	1	0	25	--	--	.25	-.36	.10	5	0	3.0	4	8.2	---	33	SW	29	3	8	19	7.6	34
Helena	3893	872.7	1019.1	41	20	30.7	-1.1	56	10	5	2	0	27	21	68	.31	-.14	.25	5	0	4.1	4	6.1	W	41	SW	4	2	5	23	8.1	45
Kalispell	2965	911.6	1017.7	38	25	31.5	----	48	8	9	18	0	23	25	78	.85	-----	.23	12	0	8.3	3	4.9	S	--	---	--	1	4	25	9.1	--
Miles City	2629	929.2	1017.6	40	20	30.1	----	60	29	-1	2	0	30	23	--	.32	-----	.12	5	0	5.0	4	8.6	SSE	--	---	--	6	6	18	7.1	--
Missoula	3201	902.5	1020.2	39	23	30.7	-.7	52	9	6	18	0	27	25	78	1.67	+.77	.40	11	0	12.1	6	3.9	ESE	27	NW	26	1	2	27	8.9	33
NEBRASKA																																
Grand Island	1841	949.9	1018.2	46	23	34.8	----	69	10	6	2	0	27	23	72	.26	-----	.15	4	0	1.6	1	12.2	S	--	---	--	7	7	15	6.2	--
Lincoln CO	1184	------	------	45	27	36.0	-3.1	68	10	11	2	0	24	--	--	.45	-.62	.37	5	0	1.0	1	9.0	---	50	NW	3	--	--	--	---	59
Lincoln	1180	975.6	1019.4	46	23	34.5	-3.0	68	10	10	2	0	27	23	--	.45	-.62	.38	4	0	1.6	1	8.7	NNW	--	----	--	6	9	15	6.3	--
Norfolk	1554	961.4	1018.8	42	21	31.8	-4.6	65	12	6	26	0	27	22	73	.37	-.68	.30	3	0	4.2	3	13.0	NNW	--	---	--	7	9	14	6.2	--
North Platte	2783	916.4	1018.0	49	20	34.7	-1.9	71	10	3	2	0	29	22	72	.32	-.15	.16	6	0	3.2	2	8.9	NW	52	N	3	10	8	12	5.5	56
Omaha	978	978.3	1020.0	44	25	34.5	-3.8	68	12	11	2	0	26	24	72	.51	-.56	.38	6	0	1.1	T	6.6	SSE	56	NW	3	6	11	13	6.1	47
Scottsbluff	3950	878.8	1018.1	52	19	35.5	-1.4	69	10	-1	2	0	30	17	59	.06	-.42	.03	2	0	.8	T	8.1	NW	--	---	--	11	8	11	5.1	--
Valentine CO	2581	923.5	1017.6	47	20	33.4	-1.2	69	30	1	2	0	29	--	--	.21	-.35	.07	5	0	2.7	1	8.4	---	39	NW	3	8	10	12	6.0	68

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature											Average relative humidity	Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min. 32° F. or below	Average dew point		Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
NEVADA																																
Elko	5075	845.9	1020.1	49	20	34.4	----	67	7	3	2	0	29	19	58	0.69	----	0.32	5	0	0.3	T	6.1	NE	†40	WNW	12	9	11	10	5.6	--
Ely	6257	810.4	1021.0	47	17	31.8	-.9	65	7	-1	17	0	29	--	--	.76	+.10	.42	6	1	11.5	7	11.1	---	43	SW	19	9	6	15	6.1	65
Las Vegas	2162	940.7	1017.6	64	38	50.9	-.4	75	7	28	17	0	5	21	37	.44	+.22	.44	1	0	.0	0	5.2	W	---	---	--	19	5	6	3.2	84
Reno	4397	862.5	1018.0	55	26	40.1	+.4	69	6	13	17	0	26	27	63	.61	-.03	.32	4	0	3.1	2	4.6	S	48	S	12	10	4	16	5.8	66
Winnemucca	4299	868.3	1019.0	52	25	38.3	-.1	70	7	14	2	0	26	25	62	.66	-.02	.38	7	0	.1	T	8.7	---	38	W	11	10	5	15	6.0	64
NEW HAMPSHIRE																																
Concord	339	1012.2	1018.0	44	24	34.0	-1.4	65	14	6	28	0	24	25	73	6.45	+3.37	2.78	11	0	5.2	4	5.7	NW	36	NW	27	7	8	15	6.4	39
Mt. Washington	6262	800.2	1021.3	25	9	17.0	-2.6	45	7	-13	27	0	30	--	79	3.93	-2.48	1.03	20	0	19.4	5	37.7	W	°101	SSW	3	5	5	20	7.7	32
NEW JERSEY																																
Atlantic City CO	8	1016.6	1018.6	53	37	45.2	-.4	64	11	21	21	0	11	--	--	7.55	+4.73	3.15	10	1	T	0	17.2	---	52	E	7	8	8	14	6.2	51
Newark	11	1018.3	1019.3	51	33	42.1	-1.9	71	14	20	28	0	14	31	67	6.75	+3.32	1.93	9	0	T	T	10.6	SW	†33	NNW	27	8	7	15	6.3	--
Trenton CO	56	1012.2	1019.3	50	34	42.0	-2.4	71	14	19	28	0	14	--	--	6.97	+4.24	2.02	9	2	T	T	9.8	---	34	SE	7	7	7	16	6.7	53
NEW MEXICO																																
Albuquerque	5310	850.3	1018.2	55	29	42.2	-1.1	70	4	19	2	0	21	20	44	.14	-.32	.07	2	1	T	T	7.3	N	45	W	24	20	6	4	3.0	74
Clayton	4969	878.8	1018.0	54	24	38.9	-4.4	69	12	-1	2	0	26	23	61	.28	-.27	.18	4	0	2.9	2	----	---	--	---	-	18	3	9	4.0	--
Raton	6379	804.6	1018.9	49	17	33.3	----	62	4	-10	2	0	30	17	56	.85	-----	.41	3	0	12.0	6	7.2	NE	--	---	--	14	8	8	4.1	--
Roswell	3611	894.7	1018.0	63	28	45.6	-2.5	79	4	15	17	0	22	24	47	.15	-.70	.15	1	0	.6	1	7.9	SSE	40	NW	‡11	15	6	9	4.1	69
NEW YORK																																
Albany	277	1014.9	1018.5	42	26	33.8	-2.5	63	14	6	28	0	24	25	73	3.68	+1.20	.96	10	0	8.6	4	8.8	WNW	34	NW	18	4	8	18	7.3	41
Bear Mountain	1300	------	------	43	29	35.9	----	62	14	11	28	0	22	--	--	7.55	-----	2.27	9	0	1.2	1	----	---	--	---	--	8	7	15	6.4	--
Binghamton	1601	957.7	1018.3	40	25	32.1	----	61	14	6	28	0	24	25	77	2.83	-----	.93	11	0	12.0	4	15.5	WNW	57	SE	7	2	4	24	8.3	29
Buffalo	693	989.8	1018.8	41	28	34.3	-4.2	64	14	12	5	0	21	27	76	4.47	+1.45	1.67	18	1	17.7	8	13.7	SSW	42	S	14	1	10	19	7.9	27
New York CO	10	1006.8	------	51	36	43.3	-.9	67	15	20	28	0	12	--	--	7.27	+4.31	2.38	8	1	T	0	15.7	---	61	S	7	9	9	12	6.0	59
New York	19	1011.9	1019.2	51	37	44.0	----	68	15	21	28	0	11	30	61	7.92	-----	2.65	8	0	T	0	13.7	NW	52	NW	26	6	9	15	6.4	--
Oswego	292	1005.1	1017.6	42	30	36.1	-3.3	64	14	16	27	0	21	--	--	3.30	-.09	.94	17	0	6.3	2	11.1	---	28	NW	8	3	7	20	8.2	24
Rochester	543	998.6	1018.4	41	27	34.2	-4.5	62	14	13	6	0	23	27	78	3.77	+1.23	1.16	19	0	16.3	5	11.3	SSW	37	SW	4	2	8	20	7.9	35
Syracuse	399	996.3	1018.8	42	28	35.2	-2.0	66	14	13	28	0	23	26	76	3.76	+.70	1.05	15	0	15.2	5	11.2	W	40	S	13	1	10	19	8.2	28
NORTH CAROLINA																																
Asheville CO	2203	--- --	------	52	30	41.3	-3.8	67	1	12	20	0	18	--	--	3.20	+.97	1.41	10	1	1.0	1	9.0	---	32	SE	6	9	6	15	6.2	50
Asheville	2093	945.5	1021.3	--	--	---	----	--	--	--	--	-	--	32	78	----	-----	----	--	-	----	-	7.1	NNW	--	---	--	--	--	--	---	--
Charlotte	753	992.6	1020.7	57	35	46.1	-2.8	74	14	18	20	0	14	35	72	3.19	+.62	.92	10	1	T	0	5.8	NE	28	SW	1	10	6	14	5.8	63
Greensboro	891	989.2	1021.7	55	32	43.8	-2.9	74	14	12	20	0	21	33	73	2.84	+.38	.99	11	1	.0	0	9.4	SW	27	NW	3	10	6	14	6.3	46
Hatteras	4	1019.6	1020.0	62	49	55.5	-.8	78	1	32	‡19	0	2	49	81	6.43	+2.94	3.62	8	2	.0	0	13.3	N	47	W	3	8	7	15	6.4	53
Raleigh CO	400	------	------	58	37	47.3	-3.7	80	14	22	20	0	14	--	--	2.53	+.25	.90	10	0	.0	0	6.6	---	23	SW	24	11	10	9	5.0	61
Raleigh	438	1005.1	1021.1	58	34	46.1	----	81	14	18	21	0	18	34	68	2.71	-----	1.06	11	0	.0	0	7.8	NE	--	---	--	12	8	10	5.2	--
Wilmington	30	1019.3	1020.8	63	42	52.5	-1.3	80	1	22	20	0	7	43	--	7.10	+5.14	4.42	10	2	.0	0	9.2	NNW	31	NW	3	11	7	12	5.2	64
Winston-Salem	967	985.4	1021.3	55	33	44.2	-3.6	71	14	19	20	0	20	30	61	3.32	+.96	.89	11	0	T	T	11.6	NE	--	---	--	11	5	14	6.0	--
NORTH DAKOTA																																
Bismarck	1653	955.0	1017.6	35	11	23.2	-3.3	53	29	-17	23	0	30	15	81	.20	-.37	.10	6	0	2.4	1	8.8	NW	47	NW	3	5	9	16	6.9	54
Devils Lake CO	1471	961.1	1016.9	28	9	18.9	-5.6	50	8	-14	24	0	30	--	--	.31	-.41	.25	5	0	5.6	5	8.4	---	28	N	3	4	15	11	6.0	60
Fargo	895	980.7	1017.2	30	13	21.0	-6.1	48	12	-12	24	0	30	15	80	.70	-.20	.45	6	0	7.9	7	12.7	SSE	35	N	3	11	7	12	5.7	58
Williston CO	1877	946.5	1016.8	33	16	24.2	-3.0	52	28	-6	23	0	30	18	78	.21	-.37	.12	5	0	3.0	2	6.4	---	26	W	2	4	8	18	7.2	43
OHIO																																
Akron	1210	980.7	1020.0	42	26	33.9	-5.9	64	13	13	20	0	23	26	77	4.24	+1.71	1.37	17	0	11.7	4	12.5	WNW	--	---	--	4	5	21	7.8	--
Cincinnati OBS	761	------	------	47	31	38.7	-3.8	69	13	14	3	0	20	--	--	4.42	+1.57	1.57	14	0	3.7	1	8.2	---	27	S	13	--	--	--	---	33
Cincinnati	871	987.7	1020.5	46	30	37.6	----	68	13	12	3	0	2	27	70	4.30	-----	1.54	15	0	2.8	1	11.8	SSW	--	---	--	4	7	19	7.8	--
Cleveland CO	663	------	------	44	32	38.0	-2.9	66	13	20	21	0	17	--	--	4.75	+2.11	1.35	15	0	----	-	----	---	--	---	--	--	--	--	---	--
Cleveland	787	991.2	1019.1	43	29	35.7	-3.3	65	13	15	20	0	20	28	76	5.85	+3.21	1.46	17	0	18.8	10	13.7	S	44	W	26	1	10	19	7.9	30
Columbus CO	724	------	------	45	31	37.6	-4.3	69	13	18	20	0	19	--	--	4.41	+1.64	1.37	12	1	2.0	1	----	---	--	---	--	--	--	--	---	--
Columbus	815	988.2	1020.5	45	29	36.7	-3.4	70	13	13	20	0	21	27	72	4.42	+1.35	1.29	12	1	1.9	1	10.3	S	33	W	4	2	6	22	8.1	38
Dayton	1002	983.1	1020.4	44	28	36.0	-4.4	66	13	13	3	0	21	26	74	3.68	+.82	.98	12	0	.5	T	13.7	S	43	S	13	4	9	17	7.6	47
Sandusky CO	603	995.9	------	43	31	37.2	-3.9	62	13	19	5	0	19	--	--	3.59	+1.20	1.42	16	0	4.3	2	10.6	---	35	SW	4	2	10	18	7.6	47
Toledo	621	995.6	1019.4	42	27	34.7	-4.0	60	13	13	20	0	21	27	75	3.49	+1.09	1.54	11	1	7.0	3	13.3	SSW	‡36	SW	13	4	7	19	7.6	38
Youngstown	1178	975.3	1019.1	42	26	34.2	-6.0	66	13	9	21	0	22	27	77	4.38	+2.06	1.06	18	0	12.9	6	11.8	SW	†37	WSW	4	2	9	19	7.9	--
OKLAHOMA																																
Oklahoma City	1254	972.6	1020.2	53	33	43.3	-5.5	77	12	17	18	0	14	34	76	1.19	-.68	.79	8	0	1.6	1	14.7	S	41	S	11	14	5	11	5.0	60
Tulsa	672	995.3	1019.9	53	34	43.4	-5.5	77	12	19	18	0	13	34	74	1.98	-.12	.63	10	0	3.7	2	12.6	S	32	S	11	9	9	12	5.8	55
OREGON																																
Baker	3369	------	------	--	--	----	----	--	--	--	--	-	--	25	--	----	-----	----	--	-	----	--	7.3	SE	--	---	--	--	--	--	---	--
Baker CO	3446	895.7	1020.0	44	27	35.7	-.3	57	8	13	16	0	24	--	--	.68	-.37	.27	11	0	4.3	1	6.1	---	24	SW	28	4	6	20	7.7	44
Burns CO	4140	873.4	1019.2	45	23	33.6	-1.6	59	6	11	16	0	28	26	77	1.53	+.23	.48	11	0	8.2	4	---	---	--	---	--	6	7	17	6.9	--
Eugene	364	1002.0	1015.9	54	38	46.3	----	65	7	27	17	0	4	42	86	7.40	-----	1.44	15	0	.0	0	7.6	S	--	---	--	1	8	21	8.3	--
Meacham	4050	875.4	1018.4	40	28	34.0	----	53	6	15	1	0	25	27	78	3.28	-----	.62	16	0	23.5	13	6.7	ESE	--	---	--	1	7	22	8.7	--
Medford	1314	968.8	1017.1	54	35	44.6	+.7	68	5	28	17	0	11	37	79	2.43	+.09	.80	15	0	.0	0	5.4	N	†38	SSE	19	1	7	22	8.5	--
Pendleton	1489	962.8	1017.5	48	33	40.6	-.8	63	30	21	1	0	16	34	77	1.14	-.51	.19	13	0	.4	T	8.3	S	--	---	--	2	7	21	8.1	--
Portland CO	30	------	------	52	42	47.2	+.4	62	5	33	16	0	0	--	--	6.42	+.32	.93	17	0	.0	0	----	---	--	---	--	--	--	--	---	--
Portland	21	1009.5	2025.3	51	40	45.7	+.4	64	5	31	16	0	2	39	79	5.31	-----	.90	18	1	.0	0	7.2	SE	56	W	10	1	2	27	9.2	22
Roseburg CO	479	997.3	1016.3	57	41	48.7	+2.8	67	5	30	17	0	2	--	--	5.32	+.66	1.49	16	0	.0	0	4.0	---	38	SW	10	2	7	21	8.4	24
Salem	195	1007.8	1015.2	53	38	45.3	-.3	64	5	27	16	0	6	41	86	6.99	+.88	1.57	19	2	.0	0	7.4	S	--	---	--	1	2	27	9.0	--
Sexton Summit CO	3836	------	------	46	37	41.7	----	62	5	29	15	0	9	--	--	6.54	-----	1.31	16	0	1.8	1	----	---	--	---	--	7	4	19	7.1	--
Troutdale	29	------	------	51	40	45.5	----	58	5	29	24	0	1	--	--	7.29	-----	1.07	17	1	.0	0	----	---	--	---	--	1	5	24	8.7	--
PENNSYLVANIA																																
Allentown	381	1005.8	1020.1	46	28	36.9	-5.1	68	14	13	28	0	22	29	75	7.83	+4.98	2.35	11	0	.1	T	8.9	W	--	---	--	6	7	17	7.1	--
Curwensville	2215	------	------	38	23	30.5	----	58	15	6	21	0	25	23	76	4.39	-----	.76	17	0	14.9	4	12.7	WSW	30	SE	7	3	6	21	8.3	--
Erie CO	655	------	------	43	32	37.6	-3.8	64	‡13	20	21	0	15	--	--	4.34	+1.04	1.57	20	0	11.2	4	10.3	---	38	SW	4	3	7	20	7.8	27
Harrisburg	335	1006.1	1020.1	46	31	38.7	-4.1	71	14	18	28	0	18	27	66	4.61	+2.35	1.21	10	0	.7	1	8.4	WNW	37	NW	26	6	8	16	6.9	50
Park Place	1932	------	------	40	25	32.8	----	60	7	8	28	0	24	--	--	6.74	-----	1.84	12	0	7.4	3	----	---	--	---	--	6	5	19	7.3	--
Philadelphia CO	26	------	------	52	36	43.6	-2.1	71	14	22	28	0	13	--	--	6.13	+3.43	1.55	9	3	T	0	8.7	---	56	SE	7	9	8	13	6.2	57
Philadelphia	13	1015.2	1019.6	51	34	42.5	-1.4	72	14	19	28	0	14	31	67	5.83	+3.13	1.45	9	1	T	T	10.7	WNW	†34	SE	7	6	9	15	6.6	--
Pittsburgh CO	749	------	------	46	33	39.4	-3.5	71	13	19	21	0	15	--	--	3.32	+1.03	.70	19	0	3.8	-	----	---	--	---	--	--	--	--	---	25
Pittsburgh	1248	988.8	1020.1	45	30	37.4	-3.8	70	13	16	21	0	21	27	70	3.75	+1.46	.65	18	0	7.9	‡1	13.0	S	35	W	26	2	5	23	8.2	37
Reading CO	266	1007.5	1019.6	48	33	40.7	-3.2	70	14	20	28	0	14	--	--	6.80	+4.07	2.54	10	0	T	T	11.2	---	38	E	7	6	7	17	7.0	38
Scranton CO	746	989.8	1019.6	44	30	36.8	-3.7	67	14	13	28	0	20	--	--	5.27	+2.50	1.52	12	0	3.8	1	6.6	---	30	NW	26	5	7	18	7.5	28
Williamsport	527	1000.3	1019.7	44	27	35.4	-5.8	64	14	12	21	0	21	26	72	5.24	+2.49	1.61	13	0	4.8	2	8.1	W	†48	ESE	7	4	7	19	7.6	--
RHODE ISLAND																																
Block Island	110	1013.9	1018.3	51	38	44.3	-.3	67	3	20	28	0	8	--	--	6.54	+2.91	1.91	11	0	T	T	----	---	--	---	--	6	8	16	6.5	--
Providence CO	12	------	------	51	33	42.0	+1.6	70	14	15	28	0	13	--	--	8.10	+5.04	2.30	11	1	T	0	----	---	--	---	--	--	--	--	---	--
Providence	55	1012.5	1018.4	50	32	41.3	+1.9	69	14	14	28	0	14	30	68	8.26	+5.20	1.99	12	0	T	0	9.8	NW	45	SE	3	10	7	13	5.9	53

See footnotes at end of table.

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Date	Temperature: Lowest	Date	No. of days: Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
SOUTH CAROLINA																																
Charleston CO	9	1019.0	------	64	47	55.4	-2.7	80	1	28	20	0	2	--	--	2.05	-0.09	1.27	7	2	0.0	0	10.2	---	31	NE	6	11	4	15	5.6	58
Charleston	41	1019.3	1020.9	65	42	53.4	+2.2	80	‡1	24	21	0	8	43	75	2.46	+.32	1.53	9	1	.0	0	7.2	NE	--	---	--	10	5	15	5.8	--
Columbia CO	332	1008.1	------	62	40	50.6	-3.5	77	13	21	20	0	9	--	--	1.91	-.07	1.19	9	2	.0	0	7.5	---	26	S	14	13	6	11	5.1	60
Columbia	217	1012.9	1021.0	63	37	49.9	----	79	14	17	20	0	13	38	74	2.31	----	1.32	9	1	.0	0	6.8	NE	--	---	--	11	7	12	5.3	--
Florence	146	1015.2	1020.9	63	39	50.7	----	81	14	20	20	0	11	38	69	2.49	----	1.65	8	0	.0	0	7.6	NNE	--	---	--	11	8	11	5.5	--
Greenville	1006	982.7	1020.6	56	36	46.2	-3.4	70	1	20	20	0	12	34	70	2.23	-.95	.60	12	0	T	T	8.3	NNE	34	N	26	11	4	15	5.9	62
Spartanburg	801	990.5	1021.1	56	36	45.9	-4.5	71	1	21	20	0	13	35	72	2.67	-.34	.89	12	0	.4	T	8.2	SW	†50	W	1	10	7	13	5.9	--
SOUTH DAKOTA																																
Huron	1282	968.8	1017.7	40	17	28.2	-3.3	61	9	2	5	0	29	18	73	.14	-.45	.05	5	0	1.4	1	11.7	SSE	63	NW	3	6	13	11	5.9	58
Rapid City	3215	900.1	1017.1	47	20	33.2	-1.4	66	20	-2	2	0	30	19	65	.21	-.28	.12	4	0	2.4	2	10.1	NNW	47	NW	3	5	12	13	6.3	55
Sioux Falls	1420	965.1	1018.5	39	17	27.6	-5.8	60	30	-2	5	0	29	18	73	.26	-.78	.10	3	0	3.2	1	11.0	S	†47	NW	3	5	8	17	7.1	--
TENNESSEE																																
Bristol	1519	965.8	1021.4	51	30	40.6	-6.8	72	13	12	20	0	20	30	72	3.66	+1.21	.92	13	1	.6	T	7.4	W	†28	ESE	6	7	6	17	7.1	--
Chattanooga	670	993.6	1021.7	55	34	44.1	-3.8	70	15	19	21	0	16	33	72	4.00	+.64	.99	10	2	T	T	6.9	SSW	29	NW	3	7	6	17	6.6	34
Knoxville	949	985.8	1021.7	53	33	42.7	-3.8	73	13	20	20	0	18	34	74	4.96	+1.89	2.66	12	3	T	T	7.8	NE	‡34	SW	13	6	8	16	6.7	34
Memphis CO	271	------	------	54	39	46.6	-5.1	74	13	22	‡18	0	9	--	--	3.35	-.89	1.17	9	-	T	T	----	---	--	---	--	--	--	--	---	--
Memphis	263	1006.4	1021.4	56	35	45.6	-4.5	75	13	20	3	0	14	34	69	2.89	-2.01	1.18	10	1	.2	T	11.7	S	43	S	13	7	10	13	6.2	51
Nashville	577	1001.7	1021.7	53	32	42.7	-6.3	73	13	15	3	0	18	33	72	4.16	+.66	.96	11	2	2.4	2	7.7	SSE	33	N	15	6	9	15	6.6	43
TEXAS																																
Abilene	1752	957.0	1018.9	62	39	50.5	-2.1	82	12	16	18	0	11	35	65	.37	-.98	.25	5	0	T	T	12.3	S	42	NW	5	14	4	12	4.8	70
Amarillo	3590	889.9	1017.9	57	29	42.9	-.9	76	30	13	2	0	22	27	64	.25	-.67	.14	4	0	.9	T	11.4	SW	42	W	12	18	4	8	3.8	68
Austin	515	998.6	1020.5	68	46	56.9	-1.6	91	13	25	3	2	3	44	71	1.06	-1.25	.47	4	0	.0	0	9.8	S	48	NW	5	7	7	16	6.4	48
Big Spring	2533	929.2	1019.2	63	38	50.7	-2.3	79	12	25	18	0	10	34	60	.15	-.88	.11	3	0	T	T	14.0	S	--	---	--	12	7	11	5.0	--
Brownsville	16	1015.9	1018.3	75	58	66.2	-1.0	88	14	38	3	0	0	57	78	.20	-2.08	.07	7	0	.0	0	11.7	SE	34	N	6	2	10	18	7.9	51
Corpus Christi	40	1019.9	1019.9	72	55	63.3	+.5	93	13	31	3	2	1	54	79	1.43	-.56	.69	10	0	.0	0	13.1	SSE	46	N	5	6	7	17	6.9	35
Dallas	487	1001.0	1020.1	63	42	52.5	-3.9	86	12	21	18	0	6	41	70	.62	-1.92	.47	5	0	T	T	10.0	S	32	SW	21	14	7	9	4.7	64
Del Rio	957	985.8	1020.3	70	47	58.4	-1.6	91	13	31	3	1	2	43	65	.05	-1.19	.05	2	0	.0	0	8.9	E	31	NW	5	9	5	16	5.9	71
El Paso	3920	883.5	1017.0	64	38	51.0	-.1	74	5	21	27	0	10	27	43	.12	-.38	.12	1	0	.0	0	8.8	N	42	W	1	14	7	9	4.3	83
Fort Worth	688	995.6	1020.3	63	41	52.3	-2.2	85	12	22	18	0	7	38	68	1.00	-1.58	.50	5	0	.6	T	14.6	S	†42	NNW	15	15	2	13	4.8	--
Galveston CO	7	------	------	66	55	60.4	-2.9	77	15	36	18	0	0	--	--	.53	-2.80	.29	6	-	.0	0	13.6	---	42	NW	5	--	--	--	---	44
Galveston	7	1020.0	1020.5	66	54	59.9	-3.4	78	15	36	18	0	0	53	80	.86	-2.47	.45	6	3	.0	0	13.4	SSE	--	---	--	6	7	17	7.0	--
Houston CO	41	1015.2	------	67	51	59.2	-1.8	85	15	30	18	0	1	--	--	1.42	-2.42	.92	9	1	.0	0	11.1	---	35	NW	17	5	6	19	7.3	34
Houston	41	1018.0	1020.7	68	49	58.2	-1.7	86	15	28	3	0	2	48	76	1.53	-2.23	1.08	7	2	.0	0	13.8	SSE	--	---	--	4	7	19	7.4	--
Laredo	500	1003.4	1018.6	74	53	63.7	-.1	95	13	33	3	3	0	50	68	.37	-.80	.28	3	0	.0	0	12.3	SSE	†28	NE	16	2	13	15	7.2	--
Lubbock	3238	904.5	1018.0	60	30	45.0	-4.3	75	4	16	17	0	18	28	61	.06	-.60	.03	4	0	T	T	12.9	S	†46	W	13	16	5	9	4.4	--
Palestine CO	491	1002.0	1020.3	64	45	54.3	-2.9	85	13	25	18	0	7	--	--	2.43	-1.00	1.33	7	1	T	T	8.5	---	24	NW	16	11	7	12	5.4	58
Port Arthur CO	5	1019.6	------	66	50	58.2	-2.9	83	14	29	18	0	2	--	--	1.90	-1.19	1.30	5	3	.0	0	13.0	---	33	N	17	9	8	13	5.9	49
Port Arthur	5	1020.0	1020.7	67	47	57.1	----	85	14	28	18	0	4	49	84	2.23	-----	1.13	8	3	.0	0	11.2	SE	--	---	--	10	4	16	6.3	--
San Angelo	1903	951.2	1019.2	65	40	52.4	-1.3	83	12	23	18	0	9	35	58	.16	-1.15	.12	2	0	T	0	11.3	SSW	†30	NNE	15	11	6	13	5.4	--
San Antonio	782	994.9	1019.9	69	47	58.1	-2.2	91	13	27	3	1	3	44	67	.67	-1.23	.31	5	1	.0	0	9.4	N	†39	NW	5	5	10	15	6.8	47
Victoria	109	1015.6	1020.0	70	51	60.2	-3.2	88	13	32	3	0	1	51	78	1.90	-.63	1.23	10	2	.0	0	9.6	N	†61	N	5	5	10	15	6.8	--
Waco	504	1001.4	1020.0	65	43	54.1	-3.4	87	13	22	18	0	8	44	74	.56	-2.13	.50	3	0	T	0	12.7	S	--	---	--	10	8	12	5.4	--
Wichita Falls	1027	981.7	1019.5	59	36	47.9	-6.2	82	12	22	18	0	11	35	64	.20	-1.54	.12	5	0	2.0	2	11.3	S	†35	N	5	16	4	10	4.3	--
UTAH																																
Milford	5029	846.3	1021.7	48	21	34.5	-3.1	68	4	2	26	0	28	22	65	.76	+.10	.37	6	0	6.5	3	6.4	S	†35	S	12	13	8	9	4.6	--
Salt Lake City	4222	868.9	1020.1	47	27	37.1	-2.3	63	10	14	2	0	26	25	66	1.59	+.43	.62	8	0	11.5	5	6.0	SE	33	NW	‡1	11	5	14	5.9	54
VERMONT																																
Burlington	398	1002.7	1017.8	39	26	32.7	-3.6	64	14	3	28	0	22	25	74	4.48	+1.82	1.63	12	0	14.4	4	11.4	SSW	‡34	SW	13	4	8	18	8.0	23
VIRGINIA																																
Cape Henry	16	1019.3	1020.0	57	43	50.4	-1.7	79	16	32	19	0	2	--	—	5.55	+3.19	2.30	12	1	.0	0	15.8	---	43	N	16	9	10	11	5.5	54
Lynchburg	947	986.5	1020.9	52	32	42.0	-3.2	69	16	18	20	0	19	29	64	5.10	+2.77	2.65	12	0	.0	0	9.1	SSW	29	S	14	11	7	12	5.9	50
Norfolk CO	11	1017.3	1020.5	58	41	49.7	-1.7	77	16	29	20	0	3	--	--	6.34	+4.18	2.74	12	1	T	0	11.0	---	38	SE	7	--	--	--	---	55
Norfolk	25	1019.3	1020.5	58	40	49.1	-.2	78	16	27	19	0	6	38	70	7.01	+4.85	2.75	13	0	T	0	11.8	NW	--	---	--	10	8	12	5.7	--
Richmond CO	162	------	------	56	35	45.5	-2.8	77	14	20	21	0	14	--	--	4.81	+2.60	1.44	11	-	T	T	----	---	--	---	--	--	--	--	---	--
Richmond	160	1014.6	1020.7	56	34	44.7	-1.4	78	14	18	21	0	18	33	69	4.52	-----	1.23	11	1	T	T	8.0	N	32	SE	7	10	9	11	5.8	53
Roanoke	1192	978.3	1021.0	51	31	41.2	-5.8	68	11	16	21	0	20	28	64	3.41	+1.20	1.56	10	0	T	T	10.2	NW	--	---	--	4	11	15	6.9	—
Washington CO	72	------	------	52	35	43.6	-1.6	75	16	23	21	0	15	--	--	5.01	+2.64	1.61	11	-	T	T	8.2	---	33	NW	16	--	--	--	---	--
Wash. Nat'l. AP	14	1016.6	1020.8	53	36	44.1	-1.1	74	16	25	21	0	14	30	61	4.79	+2.42	1.51	11	0	T	0	11.6	WNW	44	SE	7	9	5	16	6.4	48
WASHINGTON																																
Ellensburg	1727	953.6	1017.5	44	27	35.2	-1.0	58	7	15	1	0	26	30	85	.97	-.50	.37	11	0	1.1	1	5.6	E	--	---	--	4	7	19	7.8	--
Kelso	17	------	------	51	37	44.1	----	59	5	22	1	0	7	--	--	6.59	-----	1.37	19	0	T	0	----	---	--	---	--	0	3	27	9.2	--
North Head CO	194	1005.1	1012.9	53	43	47.9	-.3	65	5	34	24	0	0	--	--	8.46	+.01	1.13	20	2	T	0	16.5	---	65	S	25	4	6	20	7.7	33
Olympia	190	1007.1	1014.1	50	36	43.0	----	58	7	22	1	0	8	40	90	7.32	-----	.91	18	0	.0	0	4.8	SSW	--	---	--	0	3	27	9.3	--
Port Angeles	11	1012.5	1013.3	50	42	45.8	----	62	18	36	1	0	0	40	80	2.89	-----	.51	16	0	.0	0	10.2	W	--	---	--	0	4	26	9.2	--
Seattle	14	1012.9	1014.2	--	--	----	----	--	--	--	--	-	--	39	78	----	-----	----	--	-	----	-	9.1	S	--	---	--	--	--	--	---	--
Seattle CO	14	------	------	53	43	47.7	+.9	58	10	32	24	0	1	--	--	5.01	-.02	1.07	18	1	T	T	10.3	---	47	SW	30	0	3	27	9.2	19
Spokane	2357	947.5	1017.7	42	30	35.7	-2.8	52	30	19	16	0	20	30	81	1.88	-.21	.56	12	0	.7	T	7.3	SSW	34	SW	‡26	2	5	23	8.5	16
Stampede Pass CO	3960	876.4	1016.9	33	26	29.7	----	45	7	19	16	0	30	--	--	12.65	-----	2.69	15	0	63.1	41	11.5	---	51	E	19	1	6	23	8.5	--
Stevenson CO	319	------	------	49	40	44.1	----	57	7	32	23	0	1	--	--	9.55	-----	1.86	17	2	.4	T	----	---	--	---	--	3	2	25	8.4	--
Tacoma CO	127	1006.8	1013.9	51	40	45.8	+1.2	60	30	30	16	0	3	--	--	3.61	-2.65	.71	17	0	.0	0	6.7	---	32	SW	28	0	7	23	8.6	24
Tatoosh CO	101	1008.5	1011.8	51	44	47.5	+1.6	61	18	40	15	0	0	42	81	11.63	-.30	2.08	19	2	T	0	19.4	E	68	S	30	0	4	26	9.1	24
Walla Walla	1200	------	------	—	—	----	----	—	--	--	--	-	--	35	—	-----	-----	----	--	-	----	--	6.7	SSE	--	---	--	--	--	--	---	—
Walla Walla CO	949	981.4	1018.0	48	36	41.7	-1.1	64	30	22	18	0	9	--	--	.89	-1.13	.18	11	0	.0	0	5.2	---	28	W	28	2	7	21	8.1	33
Yakima	1061	977.3	1017.2	49	27	37.8	-.3	59	4	17	1	0	27	31	78	1.47	+.23	.31	12	0	T	T	5.7	W	--	---	--	5	7	18	7.3	--
Seattle-Tacoma AP	379	1001.7	1014.2	51	38	44.5	----	57	30	28	24	0	7	38	82	5.44	-----	.87	18	0	T	0	11.7	SE	--	---	--	1	5	24	8.9	--
WEST VIRGINIA																																
Charleston	950	984.8	1020.9	51	31	41.1	----	77	13	16	21	0	20	29	69	4.79	-----	1.21	13	0	4.0	2	9.7	WNW	†30	WNW	18	3	4	23	8.3	--
Elkins	1969	947.9	1021.3	46	24	34.9	-4.4	66	14	3	21	0	24	27	78	3.56	+.78	1.09	15	0	5.7	3	6.5	WNW	42	SE	6	2	7	21	8.3	28
Huntington	565	------	------	52	32	41.9	+.9	78	13	18	19	0	18	—	--	5.30	+2.30	.92	13	-	3.4	1	----	---	--	---	--	--	--	--	---	—
Parkersburg CO	615	------	------	49	31	40.3	-3.5	73	13	18	21	0	18	--	--	4.23	+1.66	1.00	13	1	2.3	2	7.0	---	24	SE	13	3	7	20	8.0	26
Parkersburg	837	------	1020.4	--	--	----	----	--	--	--	--	-	--	28	--	-----	-----	----	--	-	----	--	10.5	SSW	--	---	--	--	--	--	---	--
Petersburg	1013	966.5	------	50	28	38.9	----	69	14	9	21	0	20	--		3.04	-----	1.55	8	-	T	0	----	---	--	---	--	4	8	18	7.0	--
WISCONSIN																																
Green Bay	689	994.2	1017.9	34	17	25.4	-8.6	55	13	-5	6	0	28	19	80	1.66	-.50	.55	10	0	8.9	4	11.9	SW	66	SW	14	8	9	13	6.4	45
La Crosse	669	992.9	1018.5	35	18	26.5	-7.2	55	10	-1	6	0	28	19	76	1.57	+.01	.65	8	1	8.9	5	11.3	S	†28	NNW	3	7	5	18	7.1	--
Madison	857	986.1	1019.0	37	19	28.2	-6.0	60	10	0	5	0	27	20	75	2.17	+.39	.96	9	1	8.6	4	12.8	NW	49	SW	14	7	9	14	6.7	52
Milwaukee	674	991.9	1018.0	37	23	29.8	-6.1	57	15	5	5	0	26	22	76	1.99	+.22	.83	9	1	9.6	5	13.4	NW	49	SW	14	6	9	15	6.4	51
WYOMING																																
Casper	5322	835.4	1016.6	44	23	33.5	-3.2	57	9	1	1	0	25	17	54	.20	-.59	.09	4	0	4.5	2	14.7	SW	—	---	--	8	9	13	5.9	--
Cheyenne	6139	809.3	1017.4	46	21	33.5	-1.3	65	19	-5	1	0	29	18	55	.79	+.27	.40	5	0	9.4	3	13.0	W	52	NW	3	12	12	6	4.5	75
Lander	5563	834.4	1019.3	44	18	30.7	+.4	56	5	-7	2	0	30	16	58	.16	-.44	.12	3	0	4.3	3	6.0	---	36	NE	4	11	11	8	4.7	61
Rock Springs	6741	793.8	1022.2	39	17	27.6	-3.1	56	7	0	17	0	30	14	60	.06	-.49	.03	3	0	.8	T	11.6	WSW	†48	WNW	4	9	6	15	6.0	--
Sheridan	3942	882.8	1017.8	46	19	32.8	+.1	62	7	-2	1	0	30	22	68	.15	-.48	.07	7	0	1.8	2	7.7	S	42	NW	4	6	12	12	6.2	59

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Temperature: Date	Temperature: Lowest	Temperature: Date	Temperature: No. of days: *Max. 90° F. or above	Temperature: No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: No. of days: .01 inch or more	Precipitation: No. of days: With thunderstorms	Precipitation: Snow, Sleet, Hail: Total	Precipitation: Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Wind: Fastest mile: Speed	Wind: Fastest mile: Direction	Wind: Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F.	°F.	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
PACIFIC AREA																																
Canton Island	9	1008.5	1008.8	93	79	85.9	-----	97	3	75	19	24	0	73	72	0.22	-----	0.13	2	0	0.0	0	----	--	--	-	--	5	21	4	5.5	--
Hilo	28	1015.9	1017.4	79	66	72.4	-----	84	2	62	23	0	0	66	84	14.89	-----	4.39	29	0	.0	0	4.9	WSW	23	E	20	3	9	18	7.7	31
Honolulu CO	12	------	------	80	72	75.8	+1.3	84	1	70	18	0	0	--	--	.94	-2.90	.30	15	0	.0	0	----	---	--	---	--	--	--	--	---	--
Honolulu	7	1017.3	1017.9	81	72	76.9	-----	85	3	70	1	0	0	65	68	.23	-----	.16	6	0	.0	0	13.1	ENE	34	NE	7	10	14	6	5.0	63
Lihue	115	1012.9	1018.0	80	70	75.3	-----	85	1	66	28	0	0	68	77	3.22	-----	1.18	24	0	.0	0	12.7	NE	29	E	‡9	1	19	10	6.7	52
Moen Is.,Truk Gp	3	1009.5	1009.8	86	76	81.2	-----	89	26	72	4	0	0	--	--	7.83	-----	1.93	25	1	.0	0	----	---	--	---	--	--	--	-	---	--
Wake Island	9	1013.5	1014.0	85	78	81.4	-----	87	15	74	24	0	0	74	80	2.19	-----	.87	16	0	.0	0	14.1	ENE	--	- -	--	15	12	3	4.3	--
Yap Island	51	1007.5	1009.5	88	77	82.5	-----	92	20	74	26	4	0	--	--	6.65	-----	.90	23	4	.0	0	----	---	--	---	--	1	15	14	7.4	--
**Korer	117	1005.1	1008.7	89	76	82.3	-----	91	29	73	10	8	0	--	--	6.77	-----	1.78	18	1	.0	0	----	---	--	---	--	--	--	--	---	--
**Moen Is.,Truk Gp	3	1010.5	1010.9	86	75	80.3	-----	88	20	71	10	0	0	--	--	21.29	-----	4.98	23	0	.0	0	----	---	--	---	--	--	-	--	---	--
PUERTO RICO																																
San Juan CO	47	------	------	85	73	79.3	+.9	89	18	70	‡4	0	0	--	--	8.03	+1.26	1.83	15	-	---	-	----	---	--	---	--	--	--	--	---	--
San Juan	9	1011.5	1013.5	85	73	79.1	-----	90	18	70	30	0	1	72	82	6.88	-----	2.04	19	0	.0	0	4.9	ESE	26	NE	4	10	16	4	4.7	67
ALASKA								*																								
Anchorage	134	998.0	1003.1	29	17	22.7	-1.8	53	1	-6	18	0	28	21	87	.27	-.73	.10	9	0	3.3	1	3.5	N	26	SE	1	5	6	19	7.8	23
Annette Island	110	1001.7	1005.8	44	36	40.2	-1.4	58	5	26	22	0	8	35	81	8.56	-1.96	1.22	21	0	3.9	1	15.4	ESE	45	SE	17	3	3	24	8.4	--
Barrow	22	1007.3	1007.7	18	5	11.3	+10.9	33	4	-16	30	0	30	7	81	.46	+.18	.08	12	0	7.0	14	14.6	SSW	50	E	26	0	6	24	8.7	--
Bethel	21	1002.[illegible]	1003.4	28	15	21.4	+4.6	40	2	13	30	0	30	22	92	1.50	+.53	.39	7	0	10.0	4	----	N	20	SSE	15	5	4	21	7.8	--
Cordova	40	999.0	1000.0	39	24	31.4	+1.8	48	4	4	18	0	22	29	88	12.78	+4.69	4.48	16	0	.2	T	2.9	E	58	E	1	4	3	23	8.2	--
Fairbanks	436	988.[illegible]	1004.4	20	4	11.8	+9.4	47	2	-21	18	0	30	7	76	.69	-.01	.10	15	0	14.8	13	2.1	N	13	N	10	0	5	25	8.9	--
Galena	94	999.3	1004.1	20	4	12.3	+8.6	38	2	-29	29	0	30	12	88	.87	+.33	.33	15	0	12.2	11	5.3	N	30	ESE	19	2	[illegible]	26	8.8	--
Gambell	25	1002.7	1003.7	30	22	25.9	+3.0	38	9	8	27	0	30	23	85	1.88	+.83	.49	17	0	18.1	5	20.6	NNE	--	---	--	1	3	26	8.9	--
Juneau	15	1005.1	1006.[illegible]	36	26	31.1	-.8	46	4	4	20	0	20	29	88	4.70	-.70	.93	15	0	17.5	10	5.3	E	35	ESE	25	4	1	25	8.4	--
Kotzebue	10	1004.4	1004.7	20	7	13.2	+7.0	34	1	-23	30	0	30	10	81	.92	+.52	.17	15	0	17.1	17	15.8	ESE	58	E	19	3	5	22	8.1	--
McGrath	334	991.5	1004.7	23	11	16.7	+13.5	39	2	-24	30	0	30	16	87	1.12	+.04	.54	15	0	16.4	13	4.1	N	29	S	15	0	4	26	9.2	--
Nome	13	1002.4	1003.1	27	17	21.8	+5.9	37	2	-8	25	0	30	20	87	1.53	-.56	.38	6	0	18.8	11	10.4	ENE	39	E	19	7	3	20	7.2	--
Northway	1713	943.1	1008.8	8	-8	-.2	+3.3	28	4	-38	16	0	30	-2	77	.38	+.04	.26	6	0	[illegible].8	7	1.2	SE	--	---	--	3	2	25	8.5	--
St. Paul Island	22	1000.[illegible]	1002.0	39	30	34.4	+1.9	43	1	15	24	0	17	31	82	3.19	+.36	1.47	24	0	2.0	2	----	---	--	---	--	0	9	21	8.3	--
Umiat	337	996.6	1010.2	13	6	9.5	+13.9	27	‡2	-31	30	0	30	1	83	.37	-.13	.12	10	0	3.7	9	6.5	W	30	ENE	25	2	5	23	8.7	--
Wales	9	1003.1	1003.7	29	19	24.0	+5.6	38	1	-3	25	0	29	--	--	.83	+.32	.14	16	0	7.4	6	----	---	--	---	--	2	5	23	8.6	--
Yakutat	28	1000.9	1002.1	39	26	32.6	+.2	47	‡1	-3	19	0	17	30	86	10.32	-5.08	1.61	15	0	13.9	14	7.7	E	43	ESE	6	2	6	22	8.4	

Data from airport unless otherwise specified. CO indicates data from city office.
† Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
‡ Other dates also.
° Peak Gust.
* Number of days Max., 70°F. or above for Alaskan Stations.
** October 1951.

HEATING DEGREE DAYS

Table 3 (Base 65°F.) NOVEMBER 1951

State and station	Current season		Long term mean July through this month
	This month	Period July through this month	
ALABAMA			
Birmingham	513	601	457
Mobile (CO)	338	369	243
Mobile	353	384	
Montgomery (CO)	427	458	350
Montgomery	453	488	354
ARIZONA			
Flagstaff	922	1783	1751
Payson (CO)	559	792	
Phoenix (CO)	140	148	185
Phoenix	186	197	
Prescott	620	921	
Tucson	187	205	
Winslow	696	951	
Yuma	71	74	122
ARKANSAS			
Ft. Smith	588	711	544
Little Rock	571	697	513
Texarkana	455	528	
CALIFORNIA			
Bakersfield	239	291	332
Beaumont (CO)	330	458	
Bishop	606	878	863
Blue Canyon	656	1231	
Burbank	182	328	
Eureka (CO)	385	1542	1579
Fresno	278	367	392
Los Angeles (CO)	113	128	188
Los Angeles	134	164	
Mt. Shasta (CO)	729	1326	
Oakland	289	650	707
Red Bluff	354	434	454
Sacramento (CO)	305	393	448
Sacramento	336	440	
Sandberg (CO)	519	836	
San Diego	105	123	239
San Francisco (CO)	255	1048	893
San Francisco	322	874	875
Santa Catalina	213	457	
Santa Maria	263	656	
COLORADO			
Alamosa	1171	2230	
Colorado Springs	862	1617	
Denver	799	1480	1258
Grand Junction	860	1279	1152
Pueblo	841	1424	1200
CONNECTICUT			
Bridgeport	706	1044	
Hartford	775	1212	1175
New Haven	734	1117	1097
DELAWARE			
Wilmington	699	960	
DIST. OF COLUMBIA			
Washington (CO)	634	808	834
Washington	621	783	
FLORIDA			
Apalachicola	261	265	174
Daytona Beach	131	133	
Fort Myers	67	67	33
Jacksonville (CO)	231	239	164
Jacksonville	246	253	
Key West (CO)	7	7	2
Key West	10	10	
Melbourne	78	78	
Miami (CO)	32	32	16
Int. Airport, Hialeah	26	26	
Miami Beach	17	17	
Orlando	127	127	
Pensacola (CO)	315	329	211
Tallahassee	277	285	
Tampa	103	103	64
West Palm Beach	32	32	
GEORGIA			
Albany	348	367	268
Atlanta (CO)	545	631	535
Atlanta	518	594	
Athens	554	634	
Augusta	446	483	393
Columbus	439	478	
Macon	398	430	413
Rome	582	679	
Savannah	345	365	248
Valdosta	302	318	
IDAHO			
Boise	784	1378	1264
Lewiston	767	1356	
Pocatello	934	1710	1505
ILLINOIS			
Cairo (CO)	682	861	695
Chicago (CO)			1149
Chicago	957	1417	
Joliet	1000	1532	
Moline	965	1452	
Peoria	944	1400	1164
Springfield (CO)	849	1180	1014
Springfield	894	1286	
INDIANA			
Evansville	772	1054	797
Ft. Wayne	931	1415	1225
Indianapolis (CO)	827	1122	1028
Indianapolis	875	1269	
South Bend	981	1530	
Terre Haute	871	1253	
IOWA			
Burlington	920	1380	1122
Charles City (CO)	1104	1813	1582
Davenport (CO)	938	1370	1176
Des Moines	979	1536	1251
Dubuque	1095	1796	1389
Keokuk (CO)	809		1058
Sioux City	1031	1705	1409
KANSAS			
Concordia (CO)	799	1257	1015
Dodge City	785	1235	978
Goodland	861	1521	1176
Topeka (CO)	773	1165	951
Topeka	802	1208	
Wichita	758	1110	851
KENTUCKY			
Lexington	789	1072	904
Louisville (CO)	722	944	824
Louisville	765	1034	
LOUISIANA			
Baton Rouge	326	358	243
Lake Charles	269	286	
New Orleans (CO)	260	267	174
New Orleans	271	282	
Shreveport	400	439	350
MAINE			
Caribou	1093	2236	
Eastport	802	1661	1907
Greenville (CO)			2152
Portland	870	1597	1518
MARYLAND			
Baltimore (CO)	624	795	777
Baltimore	698	933	
Frederick	712	974	
MASSACHUSETTS			
Boston	665	1042	1105
Nantucket	603	958	1016
Pittsfield	979	1789	
MICHIGAN			
Alpena (CO)	1053	1960	1766
Detroit	902	1365	1308
Escanaba (CO)	1107	2141	1883
Grand Rapids (CO)	960	1488	1342
Grand Rapids	1011	1648	
Lansing	1022	1662	1481
Marquette (CO)	1092	2244	1938
Muskegon	987	1691	
Sault Ste. Marie	1142	2402	2054
Ypsilanti	938	1432	
MINNESOTA			
Duluth (CO)	1273		2144
Duluth	1302	2691	
International Falls	1379	2813	
Minneapolis	1176	1948	1618
Rochester	1200	1999	
St. Cloud	1266	2262	1917
St. Paul	1161	1925	1620
MISSISSIPPI			
Jackson	426	483	379
Meridian	454	521	406
Vicksburg	388	439	341
MISSOURI			
Columbia	799	1139	939
Kansas City	752	1100	905
St. Joseph	834	1258	990
St. Louis (CO)	761	1014	809
St. Louis	779	1070	
Springfield	804	1127	842
MONTANA			
Billings	889	1920	
Butte	1143	2817	
Glasgow (CO)	1128	2241	
Great Falls	878	2152	
Havre (CO)	1014	2208	1949
Helena	1023	2309	1940
Kalispell	996	2329	2104
Miles City	1041	2084	
Missoula	1022	2141	1930
NEBRASKA			
Grand Island	898	1561	
Lincoln (CO)	863	1359	1148
Lincoln	908	1475	
Norfolk	989	1686	
North Platte	902	1666	1346
Omaha	909	1430	1208
Scottsbluff	878	1858	
Valentine (CO)	940	1805	1562
NEVADA			
Elko	914	1805	
Ely	991	1929	
Las Vegas	413	499	
Reno	742	1444	1287
Winnemucca	794	1565	1535
NEW HAMPSHIRE			
Concord	922	1641	1573
Mt. Washington	1429	4176	
NEW JERSEY			
Atlantic City	590	777	835
Newark	680	967	1002
Trenton	685	963	928
NEW MEXICO			
Albuquerque	680	883	891
Clayton	772	1239	1006
Raton	943	1583	
Roswell	573	802	729
NEW YORK			
Albany	931	1539	1312
Bear Mountain (CO)	868	1442	
Binghamton	980	1692	1415
Buffalo	915	1449	1357
New York (CO)	640	896	921
La Guardia Field	621	850	
Oswego	862	1419	1402
Rochester	915	1465	1332
Syracuse	888	1451	1373
NORTH CAROLINA			
Asheville (CO)	707	921	843
Asheville	707	921	
Charlotte	513	613	575
Greensboro	629	783	753
Hatteras	302	318	325
Raleigh (CO)	532	627	598
Raleigh	565	690	
Wilmington (CO)	390	434	393
Winston-Salem	617	766	
NORTH DAKOTA			
Bismarck	1247	2337	1965
Devils Lake (CO)	1373	2647	2273
Fargo	1517	2575	2008
Grand Forks			2189
Williston (CO)	1214	2389	2095
OHIO			
Akron	928	1455	1251
Cincinnati (CO)	732	956	926
Cincinnati	816	1135	
Cleveland (CO)	805	1158	1152
Cleveland	874	1260	
Columbus	843	1242	1049
Dayton	864	1211	1061
Sandusky (CO)	829	1176	1135
Toledo	902	1371	1234
Youngstown	917	1438	
OKLAHOMA			
Oklahoma City (CO)	631	828	622
Oklahoma City	647	837	
Tulsa	639	827	
OREGON			
Baker (CO)	872	1763	1767
Burns (CO)	934	1778	
Eugene	553	1063	
Meacham	923	2008	
Medford	608	1041	1084
Pendleton	725	1246	
Portland (CO)	529	908	992
Portland	570	1061	
Roseburg (CO)	484	853	1016
Salem	585	1115	
Sexton Summit (CO)	691	1461	
Troutdale	579	1090	
PENNSYLVANIA			
Allentown	834	1250	
Curwensville	1026	1792	
Erie (CO)	817	1208	1169
Harrisburg	782	1116	1024
Park Place	959	1572	
Philadelphia (CO)	633	827	817
Philadelphia	668	888	
Pittsburgh (CO)	758	1053	1024
Pittsburgh	824	1177	1126
Reading (CO)	721	999	983
Scranton (CO)	839	1312	1244
Williamsport	882	1334	1189
RHODE ISLAND			
Block Island	615	933	992
Providence (CO)	683	1033	1120
Providence	704	1324	
SOUTH CAROLINA			
Charleston (CO)	311	328	270
Charleston	367	397	
Columbia (CO)	431	471	421
Columbia	460	509	
Florence	437	494	
Greenville	558	636	550
Spartanburg	567	665	
SOUTH DAKOTA			
Huron	1097	1982	1653
Pierre			1476
Rapid City	951	1959	1577
Sioux Falls	1119	1971	
TENNESSEE			
Bristol	728	967	
Chattanooga	621	735	582
Knoxville	662	811	696
Memphis	582	726	552
Nashville	662	844	654
TEXAS			
Abilene	443	530	443
Amarillo	660	943	804
Austin	303	317	260
Big Spring	425	504	456
Brownsville	91	91	73
Corpus Christi	160	160	116
TEXAS (Cont'd.)			
Dallas	397	453	371
Del Rio (CO)	242	242	233
El Paso	424	445	460
Ft. Worth	399	451	360
Galveston (CO)	193	193	142
Galveston	200	200	
Houston (CO)	245	246	
Houston	261	264	184
Laredo	148	148	
Lubbock	590	785	
Palestine (CO)	350	383	332
Port Arthur (CO)	257	261	199
Port Arthur	285	300	
San Angelo	385	436	
San Antonio	272	274	203
Victoria	224	227	
Waco	362	397	
Wichita Falls	515	620	
UTAH			
Milford	907	1471	
Salt Lake City (CO)	786	1222	1162
Salt Lake City	832	1340	1297
VERMONT			
Burlington	961	1660	1636
VIRGINIA			
Cape Henry	438	490	520
Lynchburg	682	894	785
Norfolk (CO)	457	528	530
Norfolk	474	582	
Richmond (CO)	585	740	699
Richmond	608	791	
Roanoke	709	939	813
WASHINGTON			
Ellensburg	886	1670	
Kelso	619	1315	
North Head (CO)	506	1553	1516
Olympia	654	1336	
Port Angeles	567	1862	
Seattle (CO)	513	1049	1119
Spokane	874	1710	1551
Stampede Pass (CO)	1052	2721	
Stevenson (CO)	618	1149	
Tacoma (CO)	571	1227	1307
Tatoosh Island (CO)	518	1900	1893
Walla Walla (CO)	691	1118	1085
Yakima	809	1501	1340
WEST VIRGINIA			
Charleston	710	978	
Elkins	896	1441	1273
Huntington	691	904	
Parkersburg (CO)	733	1052	976
Petersburg	774	1100	
WISCONSIN			
Green Bay	1181	2077	1617
La Crosse (CO)	1100	1750	1504
La Crosse	1150	1827	
Madison (CO)	1056	1737	1466
Madison	1095	1817	
Milwaukee (CO)	996	1590	1381
Milwaukee	1051	1716	
WYOMING			
Casper	936	1922	
Cheyenne	940	2018	1809
Lander	1022	2039	1980
Rock Springs	1117	2179	
Sheridan	959	2026	
ALASKA			
Anchorage	1265	3267	
Annette Island	735	1124	
Barrow	1607	5175	6071
Bethel	1300	3677	3804
Cordova	1002	3005	
Fairbanks	1595	3818	4169
Galena	1581	4101	
Gambell	1167	4223	
Juneau	1014	2709	
Kotzebue	1549	4395	
McGrath	1444	3828	
Nome	1288	4069	4232
Northway	1955	4524	
St. Paul	910	3358	
Umiat	1834	6606	
Wales	1182	5187	
Yakutat	966	2803	

Data from airport unless otherwise specified. CO indicates data from city office.

SEVERE STORMS

Table 4

NOVEMBER 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Yorktown Battlefield, Va.	1	7:40-7:50 a.m.	230		0	0	$4,500	$ 0	Tornado	One storage shed and many trees blown down.
Chef Menteur, Orleans Parish, La.	1	7 a.m.	100	1/4	0	0	15,000	0	do	Destroyed one home and damaged two others at fishing camp on Lake Catherine. Tornado cloud observed.
Kansas, eastern portion	1	Early morning						See remarks	Freeze	First freeze of season over most of eastern Kansas. Most crops matured, but apple harvest not completed and in one orchard 2,000 bushels of a 37,000 bushel crop frozen. No trees damaged by sudden temperature drop to 20°.
New England, all coastal counties	3	6 a.m.-noon					100,000		Gales, rain, and wind-driven tide and surf	South-southeast gales and rain caused widespread minor damage, especially to trees and wires. Losses considerable in the aggregate.
Norfolk, Plymouth, and Essex Counties, Mass.	3	6 a.m.-noon			2				South-south-east gale	Man electrocuted in Stoughton, when tree knocked high voltage wire across factory gate. Lobsterman from Lynn drowned when boat became disabled. Chimney collapsed at Lynn, caving roof, setting off sprinkler and damaging stock and machinery. At Attleboro, roof of apartment house collapsed.
Narragansett Bay shores, R. I.	3	6 a.m.-noon				1	15,000		do	Riverside and Bristol shore hardest hit. Many small craft losses, including a 24-foot, a 32-foot, and a 54-foot cabin cruisers. Sea-walls damaged. Coastal roads washed out.
New London County, Conn.	3	6 a.m.-noon					10,000		do	At Occum, a printing plant deroofed, damaging stock and machinery.
Washington County, Maine	3	All day				2	400		Southerly gale	Minor wind, tide, and rain damage; adequate warnings averted greater losses. Two persons suffered slight injuries in boat accidents.
Wisconsin, most of State	3				9				Snow and blowing snow	Early season snowstorm disrupted highway travel over State. Many cars and trucks stalled on highways. More than 160 traffic accidents occurred in Milwaukee County. Nine persons killed in traffic accidents, due to poor visibility and slippery roads and streets.
Iowa, central portion	3				1		See remarks		Wind and snow	Winds reached 73 m.p.h. at Des Moines Airport. Power lines downed and one plate glass front blown in. Highways hazardous in southern and eastern Iowa with numerous accidents on slippery pavements. Truck driver killed near Fairfield when his semi-trailer swerved off highway.
New York, western portion	3				1		See remarks		Snow	From 3 to 6 inches of heavy, wet snow blanketed western counties. Traffic slowed. Trees and wires broken. Communication and power services disrupted. Loss considerable. One person died from heart failure, while shoveling snow.
Missouri, (except northwest and extreme southeast)	5-6	All day	*200	250	8		Small	Small	do	Earliest heavy snow on record blanketed more than half of Missouri. At least 8 deaths counted by Associated Press. In St. Louis 4 men found dead in snow, all apparently result of natural causes. Area heaviest snow extended through Carthage, Springfield, Grovespring, Rolla, Richwoods, and Crystal City. Washington County received the deepest snow, with 20 inches at Richwoods and Potosi.
Kansas, southeastern portion	5	Afternoon and evening			1	1	See remarks		Snow and rain	Heavy snow of 8 to 15 inches fell over southeastern counties from about Hutchinson and Anthony eastward to Missouri line. Some freezing rain preceded snow, making highways and streets slippery. Heavy snow blocked traffic. Two shifts at aircraft plant at Wichita cancelled. Ordnance plant at Parsons closed 2 days and many schools closed. Principal loss was to business and to cars resulting from numerous accidents.
Illinois, northern and central portions	6-7						500,000	See remarks	Snow and wind	An average snowfall of 8 to 12 inches caused highway blockages. This, together with high winds, resulted in some damage to corn, but an estimate is impracticable. The northeasterly winds, with Lake Michigan at an unusually high level, resulted in considerable loss by wave action along shore line.
Lake Michigan Shore, Ind.	6-8						100,000		Wind and waves	High winds and 30- to 50-foot waves destroyed cottages and homes, washed away much of shore line, and severely damaged highways, parks, buildings, etc. near Lake.

See footnotes at end of table.

Table 4—Continued

NOVEMBER 1951

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Wisconsin, southeastern portion	6-7	Night							Snow	Highway travel disrupted. Five persons injured in Milwaukee County.
Mercer, Burlington, and Morris Counties, N. J.	7	A.m.				5	$7,500		Rain and wind	Heavy rain caused damage to roads, minor traffic damage, and slight property damage.
Rhode Island and Massachusetts, eastern counties	7	8 a.m.-4 p.m.					5,000		South-southeast gale	Signs, roofs, and chimneys damaged by gale-driven rains. Several automobiles crushed by fallen trees.
Philadelphia area, Pa.	7	Morning				3			Rains, and winds	Heavy rains with winds to 42 m.p.h. caused local flooding, felled trees, broke windows, and tangled power lines. Injuries occurred when wind sent a show window crashing into a subway entrance. Backed-up sewers caused local flooding of streets, with some water spilling into business establishments. A brick wall, weakened by rains and wind, crashed through roof of warehouse.
Westchester County, N.Y.	7						See remarks		Rain and wind	Heavy rain flooded streets, parkways, dwellings, and cellars. Wind caused power failures.
Oregon, most of State	10-11	Afternoon, 10th-afternoon, 11th					125,000	Negligible	Wind	Southerly winds with speeds of 40 to 60 m.p.h. reported from all over State, with several points reporting gusts to 75 m.p.h. These caused considerable damage to buildings and other lighter structures, such as outdoor signs, light fixtures, etc. A large number of trees blown over, causing further property damage and traffic hazards. Large number of power failures and telephone service interruptions; however, damages not excessive to power and telephone installations.
Vancouver and a few Puget Sound stations, Wash.	10-11	Late p.m. 10th-early a.m. 11th					See remarks		do	High winds, accompanying a general storm, did some damage to trees and electric power and telephone lines. At Vancouver, gusts of wind attained estimated speeds of 65 to 70 m.p.h. Damage not extensive in that area, and total for storm, probably not over a few thousand dollars.
Mason, Tazewell, and McClean Counties, especially at Mason City, Mackinaw, and Hudson, Ill.	13	1:15 p.m.	50		0	0	42,500	$2,500	Tornado	Tornado moved from Mason City to Hudson, approximately 50 miles. However, it did not extend to the surface over much of this distance and for the most part, spent its force on open farmland.
Parma (3 miles east of), Mo.	13	1:30 p.m.	25	3	0	1	6,000	50	Tornado and hail	One house completely destroyed; roofs of house and barn destroyed; some poultry killed. Man's leg broken when his house was leveled. Light hail, up to ½ inch in diameter reported.
White Hall and Bluff Springs, Ill.	13	1:50 p.m.					1,000		Winds and hail	High winds and hail caused much property damage. Walnut-sized hailstones penetrated roofs and broke windows and electric signs.
Campbell Hill, Ill.	13	2:54 p.m.	60	6½	0	6	95,500	500	Tornado	Tornado completely demolished 10 homes and the City Hall, with additional property damage in business district.
Gary (suburban Glen Park), Ind.	13	4 p.m.	400	1/4	0	0	300,000		do	Tornado moved northeastward, severely damaging buildings, trees, etc., for a distance of about 1/4 mile; then, lifted above surface, but continued toward Lake Michigan.
Graves and McCracken Counties, Ky.	13	5-6:30 p.m.					7,000	2,500	Wind	Barns and homes ruined and damaged. Tobacco in barns ruined. Several farm animals killed. Power lines severed.
Marshall County, Ky.	13	5:50-6 p.m.	167	2	1	11	55,000	50,000	Tornado	Tornado struck at Gilbertsville and Lakeview, with strong winds in remainder of County. A dozen buildings wrecked; horses and cows killed. Tobacco ruined in barns. Death caused by a large timber blown through house.
Indianapolis, Ind.	13	6 p.m.					50,000		Rain	Basement of new house caved in by water pressure; many basements and underpasses flooded; cars stalled, etc.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
South Bend, Ind.	13	6:30 p.m.					$17,000		Wind	Buildings damaged; trees blown onto car; etc.
Williamstown, Ky.	13						1,000		do	Roofs on two pieces of property blown off causing damage.
Chicago-Waukegan area, Ill.	13-14						250,000		Winds and rain	Water damage in Waukegan excessive. Two barges tore loose from their moorings in Chicago River and damaged nine pleasure craft into which they crashed.
Minnesota, extreme southeastern and south-central counties	13-14						250,000		Ice (glaze), sleet, snow and wind	About 1,500 poles downed, and about 9,000 wire breaks occurred. Communication and electrical services seriously disrupted. Traffic delayed. A number of accidents occurred. Ice formation due mainly to moist snow that froze and clung to overhead wires. Thickness of snow and ice on wires varied from 1/8 to about 3 inches in diameter. Ice first began to form on wires about 10 p.m. of 14th, and remained on wires in some localities until 16th. Ice formation unusually heavy in Farmington and Medford areas.
Giles County, Tenn.	14	10 p.m.			0	0			Tornado	One home destroyed and six damaged; also two outbuildings destroyed and one damaged.
Cullman County, Ala.	15	P.m.			0	2	7,000		do	Two homes destroyed, one damaged, and one other building destroyed.
Blount County, Ala.	15	P.m.			0	1	1,000		do	Three homes damaged.
Cherokee (4½ miles north of), Ala.	15	8 p.m.	65-100	** 335			400		Wind and rain	Storm moved northeastward. Wind came from southwest, damaging a barn and house; 10 or 12 large pine trees, uprooted by the wind, were lying in a southwest to northeast direction. Rain, lasting 30 minutes, accompanied and followed the wind.
Oakland community (7 miles west of Florence), Ala.	15	9 p.m.	165	1½			2,600		Thunderstorm and wind	The storm that struck north of Cherokee struck again 9 miles to northeast Oakland. A house destroyed completely; three houses partially damaged, as were two barns and small outbuildings; two small houses shifted off their foundations. Oakland Ball Park badly damaged; about one-half the fence enclosing park blown down and bleacher seats damaged. Several large shade trees and a few apple trees uprooted by the wind.
Bailey Springs (6 miles northeast of Oakland), Ala.	15	9:19 p.m.	100-270	1-1/4	0	6	21,500		Thunderstorm, wind, and probable tornado	Wind again lifted after striking Oakland and continued its "leap-frog" characteristics, striking at Bailey Springs. Storm path here followed same general northeasterly direction, but wind was apparently more tornado-like, as indicated by fallen trees lying in different directions. This area suffered heaviest property damage. A house severely damaged when wind hit one corner, ripping out part of two walls and the roof. Farther along storm path a barn and two small outbuildings demolished; roof of house slightly damaged; 30 large oak trees uprooted. Another house damaged by a falling tree. Two shelters around springs demolished. Wind swept down the hill just south of the cottages on Shoal Creek and hit with terrific force along a path 800 feet wide. A cottage blown into Shoal Creek. Another cottage lifted from its foundation and practically demolished. Other cottages, outbuildings, and boat houses partially damaged. A dairy barn destroyed and four cows killed; house partially damaged. A steep rock bluff on northern edge of creek apparently caused the storm to rise. It dipped 1.4 miles to the northeast hitting another farmstead. The house was torn from its foundation and rolled along the ground for 200 feet, completely destroying it and all furnishings; owner critically injured and given only slight chance to live; his wife also injured. Garage destroyed, truck damaged, and barn roof torn off. Damage to telephone and power lines was not heavy from storms of 15th, according to representatives of these companies in Florence. The damage to these utilities estimated at $500.
Brooksville and St. Leo, Fla.	15-16							Small	Rain	Total rainfall during 24-hour period at Brooksville 7.57 inches; St. Leo 6.69 inches.
Albany (near), Ga.	16	7:55 a.m.	Narrow	Short	0	0	1,000	0	Tornado	Tornado dipped to earth at Albany Tallow Plant, 2½ miles south of Albany, then lifted from the ground. Main roof of plant lifted and carried away, but no other damage resulted. The funnel-shaped cloud was observed moving northeastward. It accompanied an active thunderstorm in Albany that produced hail in

See footnotes at end of table.

SEVERE STORMS

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										northern Albany. Winds reached 35 m.p.h. at Weather Bureau Airport Station in Albany.
Wilkes-Barre area, Pa.	19	6-9 p.m.							Snow	Sudden fall of about 3 inches of snow plus sudden drop in temperature coated highways with ice. Up to 200 cars stalled on Butler Mountain until cindering trucks could get them moving again. Similar conditions prevailed throughout Wyoming Valley, with traffic stalled for periods up to 2 hours.
Wisconsin, southern portion	22	Day							Ice (glaze)	Traffic badly disrupted because of icy highways due to freezing rain. Several persons injured in Milwaukee, because of falls on slippery walks and streets.
Iowa	22	Night				Several			Ice (glaze), sleet, and snow	Freezing rain and sleet in southern Iowa and snow in northern Iowa caused hazardous conditions on highways. Near Tama 300 cars stalled in traffic jam. Airline traffic lessened because of icy runways.
Puerto Plata, Dominican Republic	24, 25, and 26	All day			5	Several	°$25,000	°	Cold front	A cold front which moved slowly eastward over northern part of Santo Domingo caused considerable damage to crops and property in the Dominican Republic. Heaviest damage occurred in Puerto Plata and vicinity. Lower sections of Puerto Plata flooded; slides occurred in the interior and a few small bridges destroyed. Five persons killed during floods. Four sailboats lost, but the crews saved from drowning.
Kansas, northwestern and northern portions	24-25	Afternoon and evening			3	Numerous			Ice (glaze)	With advance of a cold front across State, freezing rain and sleet fell in many localities in northern portion preceding light snow. Highways became dangerous and 3 deaths resulted from accidents south of Concordia, near Oberlin, and 11 miles south of Oakley.
Iowa	25								Ice (glaze), sleet, and snow	Snow in northern Iowa and freezing rain and sleet in southern Iowa made all roads and highways hazardous. Airline traffic diminished because of icy runways.
Northern Aroostook, Piscataquis, and northern Penobscot Counties, Maine	26-27	9 a.m., 26th-6 a.m., 27th							Snow and northwest gale winds	Heavy snow was badly drifted, marooning or stranding 500 motorists in northern Aroostook County; 8 to 15 inches of snow fell (latter figure at Ripogenus Dam).
Longview and scattered stations in Puget Sound area, Wash.	27-30						See remarks	$ 0	Wind and electrical	High winds which continued for 2 days, and in northern Puget Sound areas through 29th, did occasional damage to power and telephone lines, and uprooted some trees. At Longview, power lines further disrupted by being struck by lightning. Slight damage from wind reported from 27th through 30th at many Puget Sound points including Seattle, Coupeville on Whidby Island, and near Bellingham. Damage not extensive.
Dukes and Essex Counties, Mass.	27	1 a.m.-11 p.m.			5		50,000		Northwest gale	Gloucester dragger "Mary M", blown ashore at Cuttyhunk Island, costing lives of 5 of the crew. At Lawrence, City's Christmas decorations damaged to extent of $500.
Iowa, southern and eastern portions	29 and 30	Night of 29th; early morning and night of 30th			2	11			Fog	Dense fog slowed all types of traffic, closed airports to normal traffic, and caused two fatal accidents.

* Miles instead of yards.
** Yards instead of miles.
° Crop damage included with other property damage.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS
NOVEMBER 1951

Only minor flooding was reported in the country during November. This was quite a contrast to November 1950 when record to near record floods were reported in the Central Valleys of California and western Nevada and along the North Atlantic Slope.

ST. LAWRENCE DRAINAGE.--Minor flooding occurred in the Lake Erie drainage on the St. Joseph River at Montpelier, Ohio, on the 15th. No damage was reported.

ATLANTIC SLOPE DRAINAGE.--This was the wettest November of record along the entire Maine Coast. Inland the amounts were considerably less. Minor flooding occurred along lowlands of the Androscoggin and Kennebec Rivers due to heavy rains (over 3 inches) on the 3d. Heavy rain (2 inches) again on the 7th caused similar conditions but no damage. Water storage was high at the end of the month.

Heavy rains during the first 3 days of the month caused minor flooding in tributary streams throughout the Merrimack River Basin. In the main river, streamflow reached a volume slightly below flood stage. No flood damage resulted from the overflows. Precipitation averaged from 3 to 4 inches, with some small amounts of snow added to the runoff from mountain streams.

The Schuylkill River approached within 0.5 foot of flood stage at Fairmount Dam (Philadelphia, Pa.) on the 7th due to heavy rain (1.3 inches) on the 6th and 7th.

UPPER MISSISSIPPI BASIN.--Slight flooding was reported on the Illinois and Meramec Rivers in Illinois and Missouri, respectively, between the 13th and 17th, due to snow melt and rain, and on the Rock River in Illinois during the first 6 days of November and between the 14th and 26th. The snow cover (10 to 12 inches) which fell over the Meramec Basin on the 5th and 6th began melting during the afternoon of the 8th, causing a moderate rise which began moving downstream on the 11th.

MISSOURI BASIN.--Abnormally cold weather in the Upper Missouri Basin throughout most of the first 3 weeks caused an unusual amount of ice in the Missouri River. On several days, temperatures dropped below zero in North Dakota and northern South Dakota causing heavy shore ice, which broke loose every few days and floated downstream.

Rains ranging from 0.75 to 2.2 inches in Missouri and southwestern Iowa on the 11th and 12th caused overflows along the Grand, Lamine, Blackwater and Osage Rivers between the 13th and 21st. The rainfall averaged 1.25 inches over the Missouri Basin between St. Joseph and Jefferson City, Mo. The Missouri River approached within 0.7 foot of bankfull stage at Hermann and St. Charles, Mo., on the 15th and 16th, respectively.

OHIO BASIN.--Snow depths up to 24 inches were reported in the Upper Allegheny River Basin on the 19th. Several days of above freezing temperatures combined with light rain caused some snow melt resulting in rises of from 2 to 5 feet on the 24th and 25th.

Minor flooding occurred on the White River at Edwardsport, Ind., on the 16th and 17th, and from the 25th to the 27th due to moderately heavy precipitation. Rainfall on the 13th and 14th averaged about 1 1/2 to 2 inches over the West Fork of the White River and about 1.5 inches on the 23d and 24th.

Overflows developed along the Green River at Woodbury, Ky., on the 25th due to heavy rain (2.5 inches) on the 23d and 24th. Additional rain (1 inch) on the 26th caused further rises in the middle and lower reaches of the Green River to above bankfull stage at Munfordville and Rumsey, Ky. The lower Green was still above bankfull stage in the lower portion at the close of the month.

WHITE BASIN.--Moderate to heavy rainfall (3.1 inches) from the 23d to the 24th resulted in light flooding along the White, Black and Little Red Rivers in Arkansas during the last week of the month. Flooding was still in progress on the White and Black Rivers as the month closed.

LOWER MISSISSIPPI BASIN.--The St. Francis River rose to above flood stage at Fisk, Mo., on the 14th and at St. Francis, Mo., on the 19th due to the moderate rain on the 6th, 13th and 14th. The river had fallen to a stage of 20.2 feet at Fisk, Mo., when additional heavy rain (3.5 inches) occurred over the upper and middle portions of the basin, with the heaviest total amount being 5.53 inches at St. Francis, Mo.

The Mississippi River reached a stage of 21.8 feet at Vicksburg, Miss., (flood stage, 43 feet) on the last day of November, which was the highest stage at that point on any November 30 since 1929.

COLUMBIA BASIN.--Precipitation was only slightly above normal in the Upper and Lower Willamette Basin during November. In the Middle Basin and in tributary streams to that section the precipitation amounts were considerably heavier. There were two relatively wet periods - the first from the 7th to the 14th, and the second from November 25 through the first week in December.

Many sloughs and roadside ditches refilled due to the rains during the first wet period. Some minor flooding resulted along the Willamette at Harrisburg, Oreg., and in the lower Santiam River from the rains during the latter part of November and the first part of December. No damage was reported.

FLOOD STAGE DATA

Table 5

(All dates in November unless otherwise specified)

River and station	Flood stage	Above flood stages -dates		Crest*	
		From—	To—	Stage	Date
	Ft.			Ft.	
ST. LAWRENCE DRAINAGE					
St. Joseph: Montpelier, Ohio	10	15	15	10.0	15
ATLANTIC SLOPE DRAINAGE					
Pemigewasset: Plymouth, N. H.	11	3	4	12.3	3
Suncook: N. Chichester, N. H.	10	3	4	10.4	4
Nashua: E. Pepperell, Mass.	8	5	5	8.0	5
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Rock: Moline, Ill.	10	Oct. 25 14	6 26	10.5 11.2	Oct. 28–29 17–18
Illinois:					
Morris, Ill.	13	15	15	13.0	15
La Salle, Ill.	20	14	17	21.6	15
Meramec: Pacific, Mo.	11	13	15	12.9	14
Missouri Basin					
Grand:					
Pattonsburg, Mo.	20	--	--	23.5	13
Chillicothe, Mo.	18	13	14	23.4	13
Sumner, Mo.	25	13	14	28.4	14
Blackwater: Blue Lick, Mo.	25	14	16	28.4	15
Lamine: Clifton City, Mo.	15	12	13	21.5	13
Osage:					
Warsaw, Mo.	31	13	15	31.6	14
Lakeside, Mo.	60	13	21	60.5 60.2	14 18
Ohio Basin					
Green:					
Munfordville, Ky.	28	26	28	31.5	27
Woodbury, Ky., Lock 4	33	25	**	39.6	28
Rumsey, Ky., Lock 2	34	27	**	----	--
White: Edwardsport, Ind.	12	16 25	17 27	13.0 14.3	16 25
White Basin					
Black: Black Rock, Ark.	14	24	**	23.3	27
Little Red: Judsonia, Ark.	30	25	28	34.0	27
White:					
Augusta, Ark.	32	28	**	32.9	Dec. 1
Georgetown, Ark.	21	28	**	23.1	Dec. 6
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.	20	14	**	23.1 24.0	18 27–29
St. Francis, Ark.	18	19	**	20.7 21.2	25 30–Dec. 1
PACIFIC SLOPE DRAINAGE Columbia Basin					
Santiam: Jefferson, Oreg.	13	30	30	13.1	30
Willamette: Harrisburg, Oreg.	12	30	30	13.2	30

* Provisional.

** Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

NOVEMBER 1951

Standard pressure surface (mb)	ALBANY, N. Y. (1009 MB.)				ALBUQUERQUE, N. MEX. (839 MB.)				ATLANTA, GA. (985 MB.)				BIG SPRING, TEX. (928 MB.)				BISMARCK, N. DAK. (956 MB.)				BOISE, IDAHO (918 MB.)				BROWNSVILLE, TEX. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	86	0.5	75	30	1,620	6.7	44	30	307	7.7	73	30	784	9.7	53	30	505	- 6.1	83	30	868	3.2	71	30	6	17.7	81
1,000	30	153			30	150			30	180			30	154			30	143			30	165			30	157	18.3	74
950	30	568		66	30	583			30	610	8.3	61	30	588			30	553			30	591			30	600	16.3	73
900	30	997	- 1.6	64	30	1,039			30	1,050	7.7	53	30	1,039	10.4	47	30	997	- 2.6	62	30	1,028			30	1,056	14.4	66
850	30	1,452	- 2.4	61	30	1,514			30	1,521	6.5	50	30	1,514	9.9	38	30	1,430	- 3.2	50	30	1,494	3.7	50	30	1,538	13.5	55
800	30	1,931	- 4.1	60	30	2,013	6.6	32	30	2,018	5.9	40	30	2,017	8.3	34	30	1,908	- 5.0	50	30	1,984	1.1	51	30	2,048	12.5	48
750	30	2,442	- 5.8	50	30	2,547	3.2	36	30	2,552	4.1	34	30	2,550	5.5	36	30	2,421	- 6.8	48	29	2,508	- 1.3	51	30	2,596	10.9	44
700	30	2,977	- 7.8	47	30	3,096	0.2	37	30	3,103	1.6	33	30	3,108	2.8	33	30	2,949	- 9.3	47	29	3,048	- 3.9	50	30	3,161	8.4	38
650	30	3,555	-10.5	49	30	3,689	- 2.8	37	30	3,702	- 1.1	33	30	3,706	- 0.2	29	30	3,527	-12.1	43	29	3,633	- 7.2	50	30	3,776	4.5	35
600	30	4,163	-13.2	45	30	4,317	- 6.3	33	30	4,331	- 4.6	34	30	4,340	- 3.5		30	4,127	-15.5	44	29	4,249	-10.8	48	30	4,416	1.1	30
550	30	4,825	-16.3	42	30	4,994	-10.4	32	30	5,015	- 8.7	33	29	5,024	- 7.3		30	4,785	-19.7	43	29	4,915	-14.5	43	30	5,113	- 3.2	
500	30	5,534	-20.3	39	30	5,720	-14.7		30	5,742	-13.7	32	29	5,758	-11.6		30	5,480	-24.0	42	29	5,628	-19.3	42	30	5,858	- 8.2	32
450	30	6,311	-25.1	40	30	6,517	-19.8		30	6,542	-19.2		29	6,559	-17.3		30	6,243	-29.1	41	29	6,407	-24.7	44	30	6,676	-13.7	35
400	30	7,152	-30.9		30	7,374	-26.1		30	7,401	-25.4		29	7,429	-23.7		30	7,073	-34.8	11	28	7,255	-30.8	44	30	7,555	-19.6	37
350	30	8,086	-37.6		30	8,326	-33.2		30	8,355	-32.6		28	8,388	-30.9		30	7,991	-41.9		28	8,189	-37.6		29	8,530	26.8	40
300	30	9,132	-45.0		30	9,391	-41.2		30	9,423	-40.3		28	9,464	-39.1		29	9,023	-49.4		28	9,234	-45.7		29	9,622	-35.5	
250	29	10,329	-52.1		30	10,605	-50.2		30	10,643	-49.2		28	10,688	-48.3		28	10,195	-56.0		28	10,426	-53.5		28	10,865	-45.4	
200	29	11,752	-57.5		30	12,036	-57.6		28	12,071	-57.7		27	12,128	-57.4		27	11,609	-57.6		28	11,840	-58.5		28	12,313	-57.3	
175	28	12,591	-58.1		30	12,872	-60.3		28	12,907	-61.2		27	12,962	-61.8		26	12,447	-56.2		28	12,679	-58.0		28	13,145	63.3	
150	28	13,560	-58.1		28	13,830	-63.0		27	13,849	-64.0		24	13,905	-65.2		26	13,427	-55.5		26	13,658	-58.2		27	14,078	-68.8	
125	28	14,707	-58.2		25	14,940	-65.4		26	14,961	-66.5		22	15,001	-68.3		25	14,584	-55.7		26	14,804	-58.6		23	15,161	-72.6	
100	27	16,112	-59.1		23	16,296	-68.0		23	16,293	-67.8		19	16,339	-69.9		23	16,003	-56.1		22	16,217	-60.1		20	16,465	-74.6	
80	24	17,517	-58.9		19	17,651	-66.2		20	17,616	-66.1		11	17,678	-69.6		22	17,422	-56.2		21	17,602	-59.3		17	17,764	-73.8	
60	11	19,330	-59.3		16	19,401	-64.2		17	19,397	-63.0		10	19,406	-65.3		13	19,286	-56.6		14	19,412	-59.1		10	19,486	-67.0	
50	6	20,442	-58.6		14	20,515	-62.4		16	20,521	-60.7		8	20,519	-62.1		10	20,443	-56.4		11	20,552	-58.2		9	20,596	-61.5	
40					12	21,903	-60.5		13	21,918	-58.7		8	21,906	-59.5		9	21,850	-56.1		9	21,960	-57.3		9	21,994	-56.5	
30					10	23,711	-57.3		10	23,744	-56.1		3	23,734	-55.4		5	23,679	-56.8		5	23,789	-56.1		7	23,828	-53.1	
20																									5	26,451	-49.5	

Standard pressure surface (mb)	BUFFALO, N. Y. (992 MB.)				BURRWOOD, LA. (1020 MB.)				CAMAGUEY, CUBA (1002 MB.)				CARIBOU, MAINE (992 MB.)				CHARLESTON, S. C. (1019 MB.)				CIUDAD VICTORIA, MEX. (980 MB.)				COLUMBIA, MO. (991 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	221	1.1	76	30	3	15.3	82	30	122	21.7	93	30	191	- 2.2	79	30	13	10.1	85	9	335	19.0		30	239	2.7	67
1,000	30	151			30	171	15.3	75	30	138	21.8	92	30	128			30	172	12.8	69	9	163			30	165		
950	30	567	0.1	68	30	610	13.2	65	30	592	21.6	79	30	540	- 1.9		30	609	11.6	62	9	608	17.1		30	585	2.5	62
900	30	998	- 2.1	69	30	1,058	11.5	57	30	1,054	19.1	76	30	966	- 3.7	68	30	1,054	10.1	54	9	1,063	14.1		30	1,019	1.1	59
850	30	1,452	- 3.6	64	30	1,535	10.2	47	30	1,544	16.3	77	30	1,416	- 4.7	63	30	1,528	8.5	48	9	1,545	12.3		30	1,478	0.2	57
800	30	1,929	- 5.[illegible]	55	30	2,038	9.0	39	30	2,058	13.9	72	30	1,891	- 6.7	60	30	2,028	6.9	43	9	2,053	12.6		30	1,964	- 0.4	47
750	[illegible]	2,4[illegible]1	- 7.5	[illegible]	30	2,580	7.9	31	30	2,604	11.5	63	30	2,402	- 8.3	61	30	2,564	5.4	37	7	2,603	12.0		30	2,484	- 2.0	42
700	30	2,9[illegible]3	- 9.6	54	30	3,138	6.2		30	3,176	8.7	53	30	2,927	-10.4	59	30	3,118	2.8	37	7	3,174	10.1		30	3,024	- 4.7	42
650	30	3,542	-12.0	51	28	3,746	3.6		29	3,793	5.8	44	30	3,504	-12.6	57	30	3,721	- 0.2	34	7	3,793	6.0		30	3,610	- 7.7	37
600	29	4,148	-15.0	52	28	4,389	- 0.1		29	4,438	2.3	34	30	4,103	-15.7	52	30	4,351	- 3.9	34	7	4,439	1.9		30	4,222	-11.3	
550	29	4,803	-18.2	49	27	5,081	- 4.6		29	5,137	- 1.2	24	30	4,762	-19.7	47	30	5,036	- 8.2	37	7	5,137	- 2.4		30	4,891	-15.2	39
500	29	5,509	-22.4	49	27	5,821	- 9.7		29	5,890	- 5.8		30	5,458	-23.4	46	30	5,766	-12.8		7	5,886	- 7.2		30	5,599	-19.5	41
450	29	6,274	-27.4	46	27	6,631	-15.7		27	6,714	-11.1		30	6,226	-28.2	42	30	6,568	-18.2		7	6,707	-12.2		30	6,380	-25.0	44
400	29	7,114	-32.8		27	7,503	-22.2		27	7,604	-17.6		30	7,057	-33.7	40	30	7,432	-24.5		7	7,594	-18.2		30	7,220	-31.1	43
350	28	8,043	-39.2		27	8,470	-29.8		27	8,588	-25.0		30	7,981	-39.7		30	8,390	-32.0		7	8,577	-25.2		29	8,148	-38.1	
300	28	9,081	-46.0		27	9,550	-38.2		27	9,690	-33.5		30	9,021	-46.0		30	9,460	-40.2		7	9,679	-33.5		29	9,193	-45.2	
250	22	10,268	55.1		27	10,779	-47.4		26	10,946	-43.0		30	10,217	-51.7		30	10,680	-49.3		7	10,934	-43.7		28	10,400	-52.3	
200	15	11,669	-56.6		26	12,225	-57.1		22	12,420	-54.1		30	11,650	-55.0		30	12,111	-58.4		6	12,404	-56.1		26	11,836	-57.4	
175	15	12,516	-55.5		25	13,057	-62.1		22	13,264	-60.5		30	12,502	-55.2		30	12,943	-62.3		6	13,240	-62.3		26	12,676	-59.0	
150	13	13,474	-54.7		23	14,003	-67.0		20	14,211	-67.0		29	13,482	-55.4		30	13,886	-65.7		6	14,177	-69.0		25	13,634	-59.9	
125	10	14,623	-55.0		16	15,102	-70.8		18	15,297	-72.9		24	14,634	-55.5		29	14,985	-67.9		6	15,248	-75.5		25	14,768	-61.5	
100	7	16,011	-55.0		9	16,397	-72.5		15	16,598	-76.5		21	16,050	-55.1		25	16,312	-69.0						21	16,148	-62.3	
80	7	17,465	-55.4		5	17,745	-69.2		9	17,891	-75.8		13	17,495	-56.2		22	17,660	-66.8						15	17,525	-61.8	
60					5	19,480	-64.5										7	19,419	-65.2						11	19,297	-61.3	
50																									7	20,443	-61.1	

Standard pressure surface (mb)	DODGE CITY, KANS. (926 MB.)				EL PASO, TEX. (883 MB.)				ELY, NEV. (810 MB.)				GLASGOW, MONT. (939 MB.)				GRAND JUNCTION, COLO. (855 MB.)				GREAT FALLS, MONT. (885 MB.)				GREENSBORO, N. C. (989 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	792	2.5	73	30	1,195	11.9	41	30	1,908	0.2	60	30	648	- 3.3	80	30	1,474	1.7	58	30	1,128	1.4	57	30	273	4.6	79
1,000	30	165			30	136			30	170			30	140			30	182			30	127			30	179		
950	30	584			30	579			30	602			30	554			30	610			30	552			30	603	6.6	59
900	30	1,027	4.6	59	30	1,037			30	1,049			30	982	- 1.1	65	30	1,054			30	990			30	1,045	5.3	57
850	30	1,493	5.2	45	30	1,517	12.2	36	30	1,512			30	1,437	- 2.3	54	30	1,517			30	1,452	2.2	49	30	1,511	4.5	53
800	30	1,987	3.8	40	30	2,023	9.4	38	30	2,004	2.8	54	30	1,917	- 3.8	51	30	2,008	1.5	47	30	1,939	- 0.4	50	30	2,004	3.5	44
750	30	2,516	1.4	40	30	2,563	6.6	43	30	2,532	1.2	47	30	2,430	- 5.8	51	30	2,533	- 0.6	45	30	2,454	- 3.6	51	30	2,533	1.8	37
700	30	3,061	- 1.6	41	30	3,119	4.0	40	30	3,076	- 1.9	46	30	2,962	- 8.7	53	30	3,074	- 3.2	41	30	2,994	- 6.7	54	30	3,080	- 0.4	40
650	30	3,648	- 5.5	43	30	3,720	1.3	31	30	3,666	- 5.1	44	30	3,541	-11.8	50	30	3,661	- 6.8	42	30	3,573	-10.4	54	30	3,674	- 3.2	39
600	30	4,270	- 9.3	42	30	4,357	- 2.6		30	4,287	- 8.4	47	30	4,141	-15.2	49	30	4,278	-10.4	43	30	4,180	-14.2	54	30	4,299	- 6.9	39
550	30	4,958	-13.7	40	30	5,044	- 6.6		30	4,960	-12.6	48	29	4,801	-19.1	46	30	4,948	-14.5	41	30	4,836	-18.9	52	30	4,977	-10.7	39
500	30	5,654	-18.7	37	30	5,780	-11.5		30	5,678	-17.3	48	29	5,499	-23.8	46	29	5,659	-19.1		30	5,538	-23.4	47	29	5,697	-15.4	38
450	30	6,4[illegible]5	-23.9	37	29	6,584	-16.6		30	6,465	-22.7	46	29	6,264	-29.0	49	28	6,441	-24.3		30	6,305	-28.4	43	29	6,492	-20.6	
400	30	7,282	-29.9		29	7,456	-23.1		30	7,312	-29.1	43	29	7,093	-35.1	49	28	7,286	-30.1		30	7,135	-34.6	41	29	7,346	-26.4	37
350	30	8,220	-36.2		28	8,417	-30.1		30	8,252	-36.1		29	8,010	-42.0		28	8,222	-37.0		30	8,054	-41.3		29	8,297	-33.7	39
300	30	9,274	-42.8		28	9,496	-38.2		30	9,303	-43.9		29	9,036	-49.5		27	9,277	-44.4		30	9,084	-48.7		29	9,359	-41.8	
250	30	10,482	-50.1		28	10,727	-47.2		30	10,504	-52.2		29	10,212	-55.6		27	10,475	-52.6		30	10,263	-55.2		29	10,571	-50.1	
200	30	11,919	-55.9		26	12,169	-57.4		30	11,926	-58.1		27	11,609	-57.2		27	11,897	-57.5		29	11,673	-58.0		29	12,002	-57.5	
175	30	12,764	-58.0		23	13,007	-61.8		29	12,758	-59.5		27	12,456	-55.7		26	12,735	-58.6		28	12,514	-57.5		29	12,839	-60.6	
150	23	13,735	-60.2		22	13,954	-65.2		29	13,719	-60.6		27	13,439	-54.6		26	13,698	-60.3		28	13,489	-56.4		29	13,791	-62.9	
125	27	14,869	-62.0		21	15,061	-68.0		28	14,846	-61.8		27	14,604	-55.1		26	14,830	-61.3		28	14,645	-56.2		27	14,907	-63.8	
100	22	16,233	63.1		18	16,391	-71.3		25	16,232	-63.1		26	16,023	-55.1		25	16,205	-63.7		27	16,057	-56.5		25	16,268	-64.5	
80	20	17,610	-62.9		15	17,708	-69.6		25	17,606	-62.4		25	17,452	-55.6		22	17,573	-63.2		25	17,466	-57.2		21	17,631	-64.0	
60	17	19,377	-61.9		13	19,438	-65.6		20	19,387	-61.4		21	19,274	-56.0		8	19,373	-61.6		24	19,277	-57.2		9	19,388	-61.9	
50	17	20,506	-61.3		12	20,550	-62.7		19	20,523	-61.1		20	20,435	-56.4						21	20,433	-57.4					
40	14	21,899	-59.1		11	21,938	-59.2		16	21,912	-60.1		16	21,851	-56.0						17	21,850	-57.0					
30	11	23,721	56.6		10	23,769	-54.7		14	23,708	-58.8		13	23,668	-55.6						13	23,676	-55.7					
20	9	26,313	-54.7						7	26,274	-57.0		5	26,339	-54.0						6	26,291	-54.9					
15	5	28,168	-54.3																									

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

NOVEMBER 1951

Standard pressure surface (mb)	HATTERAS, N. C. (1020 MB.)				HAVANA, CUBA (1011 MB.)				HILO, T. H. (1016 MB.)				INTERNAT. FALLS, MINN. (972 MB.)				JOLIET, ILL. (997 MB.)				LAKE CHARLES, LA. (1020 MB.)				LANDER, WYO. (828 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	3	13.0	80	30	49	22.7	81	30	9	23.4	79	30	361	- 7.2	83	30	179	- 1.0	77	30	5	13.3	82	30	1,696	- 1.4	55
1,000	30	169	12.8	74	30	147	22.9	79	30	144	22.4	79	30	131			30	154			30	173	14.5	68	30	159		
950	30	606	10.3	70	30	601	20.2	76	30	591	19.3	81	30	536	- 7.6	75	30	567	- 1.0	68	30	607	12.3	66	30	585		
900	30	1,047	8.1	63	30	1,059	17.4	76	30	1,052	16.0	84	30	954	- 7.8	75	30	994	- 2.6	61	30	1,057	10.3	62	30	1,025		
850	30	1,518	6.1	52	30	1,546	14.7	74	30	1,537	13.0	85	30	1,398	- 9.0	66	30	1,447	- 3.6	54	30	1,532	9.3	55	30	1,486		
800	30	2,013	4.5	46	30	2,058	13.0	62	30	2,045	10.7	78	30	1,866	- 9.7	58	30	1,925	- 4.2	41	30	2,034	8.5	43	30	1,973	1.3	44
750	30	2,546	2.7	41	30	2,606	11.3	50	30	2,593	9.7	49	30	2,367	-11.4	53	30	2,436	- 5.7	35	30	2,574	6.9	37	30	2,495	- 0.3	41
700	29	3,092	0.3	40	30	3,174	8.6	41	30	3,153	7.9	33	30	2,890	-13.6	48	30	2,970	- 8.2	34	30	3,130	4.5	34	30	3,039	- 4.0	41
650	29	3,690	- 2.7	40	30	3,793	5.9	30	30	3,769	5.4		30	3,458	-16.2	44	30	3,548	-11.0	33	30	3,736	1.6	31	30	3,625	- 7.9	39
600	29	4,314	- 6.0	36	30	4,436	2.7	24	30	4,411	2.2		30	4,049	-19.2	40	30	4,153	-14.2	33	30	4,371	- 2.0	32	30	4,237	-11.6	38
550	28	4,997	-10.0		30	5,141	- 1.3		30	5,109	- 2.1		30	4,692	-23.1	40	30	4,812	-18.1	34	30	5,061	- 5.9	28	30	4,903	-15.8	
500	28	5,719	-14.8		30	5,889	- 6.1		30	5,858	- 7.2		29	5,384	-27.6		30	5,514	-22.8	37	30	5,797	-10.5		30	5,610	-21.1	38
450	28	6,513	-20.3		30	6,711	-12.0		30	6,678	-12.6		29	6,137	-32.6		30	6,284	-28.1	39	30	6,605	-15.9		30	6,382	-26.8	
400	28	7,370	-26.5		29	7,596	-18.3		30	7,560	-19.0		29	6,955	-38.4		30	7,114	-33.6	41	30	7,478	-22.0		30	7,218	-33.1	
350	28	8,321	-33.3		29	8,579	-25.4		30	8,540	-26.4		29	7,860	-44.5		30	8,038	-40.1		30	8,445	-29.1		30	8,143	-39.9	
300	28	9,384	-41.6		29	9,678	-33.9		30	9,635	-34.7		28	8,876	-50.0		30	9,075	-46.5		30	9,527	-37.7		29	9,185	-46.9	
250	27	10,598	-50.0		29	10,928	-44.1		30	10,884	-44.1		28	10,055	-53.9		29	10,275	-53.0		30	10,757	-47.1		26	10,388	-53.8	
200	27	12,027	-58.0		29	12,387	-55.8		30	12,344	-55.1		26	11,483	-53.7		28	11,698	-55.6		30	12,183	-56.4		25	11,798	-58.0	
175	25	12,863	-61.4		29	13,224	-62.1		29	13,185	-60.8		26	12,342	-52.8		28	12,546	-56.3		29	13,036	-61.1		23	12,650	-59.0	
150	25	13,811	-63.9		29	14,163	-68.1		22	14,135	-66.5		26	13,335	-52.9		26	13,519	-57.2		29	13,983	-65.3		21	13,624	-58.8	
125	25	14,923	-65.7		29	15,240	-73.9		5	15,238	-72.1		21	14,474	-53.0		24	14,661	-57.8		28	15,077	-69.2		17	14,748	-58.8	
100	25	16,274	-66.2		26	16,527	-76.5						21	15,908	-53.6		17	16,084	-58.5		27	16,400	-71.3		16	16,144	-59.3	
80	18	17,623	-64.6		25	17,810	-76.1						18	17,325	-54.9		13	17,498	-59.7		25	17,714	-69.8		11	17,523	-58.5	
60	12	19,446	-61.2		21	19,500	-67.8						13	19,139	-55.5						21	19,443	-65.3		10	19,331	-58.5	
50					20	20,608	-62.8						11	20,278	-55.9						18	20,559	-62.1		8	20,476	-58.1	
40					11	21,986	-59.0						8	21,680	-56.9						15	21,947	-58.6		7	21,879	-56.8	
30																					13	23,757	-55.9		5	23,674	-57.1	
20																					11	26,343	-53.1					
15																					8	28,185	-52.5					

Standard pressure surface (mb)	LAS VEGAS, NEV. (940 MB.)				LITTLE ROCK, ARK. (1011 MB.)				MAZATLAN, MEXICO (1010 MB.)				MEDFORD, ORE. (969 MB.)				MERIDA, MEXICO (1014 MB.)				MIAMI, FLA. (1018 MB.)				NANTUCKET, MASS. (1017 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	660	10.1	40	30	79	6.7	71	29	14	26.5	70	30	401	6.7	84	18	27	23.0	74	30	4	20.7	76	30	14	6.7	78
1,000	30	141			30	169	7.6	67	29	100	26.0	71	30	142			18	151	22.8	73	30	158	20.6	74	30	153	7.0	73
950	30	575			30	595	7.4	60	29	562	24.2	63	30	569	8.7	71	18	598	20.4	73	30	603	18.3	75	30	575	4.5	72
900	30	1,028	12.9	31	30	1,037	6.4	57	29	1,025	22.3	58	30	1,013	8.2	60	18	1,063	17.3	73	30	1,063	15.8	73	30	1,011	2.6	59
850	30	1,506	10.0	32	30	1,506	5.4	58	29	1,520	19.4	55	30	1,483	5.7	57	18	1,549	14.3	74	30	1,547	13.2	71	30	1,472	0.9	58
800	30	2,006	7.1	33	30	2,000	4.3	52	29	2,039	16.5	42	30	1,976	3.1	58	18	2,060	12.8	60	30	2,055	11.3	62	30	1,958	- 0.7	53
750	30	2,541	4.3	32	30	2,533	2.8	47	29	2,594	13.5	37	30	2,506	0.7	52	18	2,603	11.4		30	2,601	9.5	50	30	2,477	- 3.0	48
700	30	3,092	1.3	31	30	3,080		44	29	3,164	10.1	41	30	3,048	- 2.3	51	18	3,175	9.0		30	3,164	7.9	30	30	3,016	- 5.2	42
650	30	3,690	- 1.6		30	3,673	- 2.9	44	29	3,785	6.2	42	30	3,639	- 5.6	48	18	3,790	6.2		30	3,775	5.1		30	3,600	- 8.0	39
600	30	4,319	- 5.1		30	4,301	- 6.3	44	29	4,428	2.3	38	30	4,256	- 9.3	43	18	4,437	2.8		30	4,420	1.2		30	4,213	-10.9	38
550	30	4,999	- 9.4		30	4,980	-10.0	38	29	5,129	- 2.0	42	30	4,927	-13.6	37	18	5,140	- 0.7		29	5,116	- 3.1		30	4,883	-14.9	39
500	30	5,727	-14.6		30	5,705	-14.5	35	29	5,877	- 6.5	46	29	5,642	-18.3	42	18	5,893	- 5.3		29	5,863	- 7.9		30	5,592	-19.1	40
450	30	6,521	-20.2		28	6,499	-19.7		29	6,701	-11.7	42	29	6,425	-23.8	44	18	6,719	-10.7		29	6,677	-13.9		29	6,375	-24.4	43
400	30	7,380	-26.7		28	7,361	-25.9		29	7,587	-17.1	40	29	7,272	-29.6	42	18	7,608	-17.0		28	7,560	-20.2		29	7,216	-30.1	44
350	30	8,329	-33.9		28	8,314	-32.9		29	8,573	-24.3		28	8,207	-36.9		18	8,595	-24.2		28	8,534	-27.6		29	8,153	-36.8	
300	30	9,391	-41.8		27	9,381	-40.6		29	9,677	-32.7		26	9,270	-44.6		17	9,699	-32.8		28	9,624	-36.1		29	9,203	-43.9	
250	30	10,604	-50.1		27	10,601	-48.7		29	10,935	-42.5		24	10,462	-53.0		17	10,955	-42.8		28	10,863	-46.2		29	10,406	-51.6	
200	30	12,035	-57.7		27	12,041	-56.4		28	12,403	-54.5		21	11,872	-58.7		17	12,420	-54.9		26	12,317	-57.7		29	11,831	-57.7	
175	30	12,872	-60.2		27	12,881	-59.7		24	13,244	-61.2		21	12,710	-58.8		17	13,260	-61.6		26	13,147	-63.9		29	12,669	-59.4	
150	30	13,827	-62.7		26	13,840	-62.9		19	14,190	-68.0		21	13,677	-59.2		16	14,201	-68.4		26	14,078	-69.2		29	13,632	-59.8	
125	30	14,944	-64.9		23	14,949	-64.4		11	15,266	-74.3		20	14,822	-60.7		16	15,275	-74.5		22	15,150	-74.0		27	14,761	-60.6	
100	26	16,298	-66.0		21	16,304	-65.7		6	16,538	-77.1		17	16,217	-62.4		13	16,544	-78.2		17	16,437	-76.0		25	16,160	-61.0	
80	24	17,647	-65.4		19	17,664	-64.8		5	17,789	-77.7		15	17,594	-62.0		13	17,817	-77.8		13	17,740	-73.1		18	17,560	-60.5	
60	18	19,413	-63.4		15	19,440	-62.7		5	19,461	-71.4		10	19,387	-61.1		8	19,483	-70.2		11	19,458	-65.3					
50	17	20,534	-62.3		12	20,564	-60.8						7	20,529	-61.7		6	20,582	-64.7		8	20,584	-61.5					
40	16	21,917	-60.7		9	21,974	-58.6										5	21,959	-59.9		6	21,983	-56.5					
30	12	23,729	-58.6		5	23,769	-56.3														5	23,812	-53.6					
20	6	26,294	-55.2																									

Standard pressure surface (mb)	NASHVILLE, TENN. (1000 MB.)				NORTH PLATTE, NEBR. (918 MB.)				OAKLAND, CALIF. (1017 MB.)				OKLAHOMA CITY, OKLA. (974 MB.)				OMAHA, NEBR. (983 MB.)				PHOENIX, ARIZ. (977 MB.)				PITTSBURGH, PA. (974 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	177	5.4	74	30	849	- 0.5	72	30	6	13.2	77	30	391	5.2	76	30	308	0.1	70	30	338	14.3	63	29	382	2.3	69
1,000	30	172			30	153			30	149	13.5	72	30	168			30	167			30	135			29	166		
950	30	591	5.0	58	30	575			30	585	12.0	66	30	594	6.7	64	30	584	1.2	59	30	579	17.4	40	29	582	2.0	63
900	30	1,033	3.9	58	30	1,008	1.9	58	30	1,033	10.5	58	30	1,034	6.2	57	30	1,015	0.4	53	30	1,033	14.7	38	29	1,017	- 0.2	62
850	30	1,497	3.5	56	30	1,470	1.9	49	30	1,507	8.4	54	30	1,502	5.6	48	30	1,472	- 0.8	49	30	1,514	11.5	40	29	1,473	- 1.4	59
800	30	1,988	2.3	56	30	1,958	0.7	45	30	2,006	6.2	47	30	1,996	4.1	46	30	1,955	- 1.9	45	30	2,018	8.5	43	29	1,955	- 2.6	55
750	30	2,514	0.6	49	30	2,479	- 2.0	45	30	2,543	3.7	43	30	2,526	2.4	44	30	2,473	- 3.7	39	30	2,557	5.8	38	29	2,470	- 4.5	48
700	30	3,059	- 2.4	45	30	3,018	- 5.4	45	30	3,090	0.7	43	30	3,074	- 0.4	42	30	3,010	- 5.9	36	30	3,109	3.1	29	29	3,007	- 6.2	45
650	30	3,648	- 5.3	44	30	3,605	- 8.5	40	30	3,690	- 2.6	38	29	3,666	- 3.5		30	3,592	- 9.1	37	30	3,711	0.2	27	29	3,589	- 8.8	48
600	29	4,268	- 8.7	45	30	4,213	-12.4	38	30	4,313	- 6.6	36	29	4,291	- 7.3		30	4,202	-12.4	34	30	4,342	- 3.7	27	29	4,200	-11.8	46
550	29	4,943	-11.9	41	30	4,878	-17.0	39	30	4,990	-11.1	34	29	4,966	-11.8		30	4,865	-16.4		30	5,024	- 8.0		29	4,865	-15.2	45
500	28	5,660	-16.5	40	30	5,580	-21.8	40	30	5,712	-16.3	34	29	5,687	-16.1		30	5,573	-21.3		30	5,757	-12.8		28	5,573	-19.8	43
450	28	6,451	-21.5		30	6,355	-27.1	38	30	6,499	-21.9	35	29	6,478	-21.0		30	6,346	-26.6		29	6,563	-18.0		28	6,353	-25.0	44
400	28	7,302	-27.2		30	7,186	-33.1		30	7,354	-28.0		29	7,332	-26.9		30	7,183	-32.6		29	7,430	-24.3		28	7,194	-30.5	44
350	28	8,250	-34.2		30	8,111	-40.0		30	8,299	-35.2		29	8,281	-33.4		30	8,109	-39.7		29	8,387	-31.9		27	8,130	-37.3	
300	28	9,311	-42.0		30	9,147	-47.1		30	9,355	-43.2		29	9,346	-40.7		29	9,145	-46.8		29	9,457	-40.1		27	9,178	-44.4	
250	27	10,520	-50.2		29	10,348	-53.5		30	10,560	-51.5		29	10,565	-48.7		27	10,335	-53.8		29	10,677	-48.9		27	10,379	-51.6	
200	26	11,947	-56.5		29	11,769	-57.0		30	11,986	-58.0		29	12,007	-56.0		21	11,781	-56.9		27	12,104	-57.3		26	11,797	-56.6	
175	25	12,787	-58.8		28	12,610	-57.2		30	12,822	-59.7		29	12,849	-59.3		15	12,646	-57.3		26	12,941	-60.6		25	12,637	-57.5	
150	19	13,723	-59.3		28	13,583	-57.7		29	13,791	-61.3		28	13,811	-61.2		15	13,620	-57.0		25	13,900	-63.6		24	13,609	-57.1	
125	16	14,839	-60.8		27	14,734	-58.8		26	14,919	-63.4		26	14,930	-63.2		13	14,771	-57.7		23	15,021	-66.3		23	14,758	-58.0	
100	14	16,213	-61.4		26	16,124	-60.3		24	16,283	-64.4		24	16,290	-65.2		11	16,176	-57.5		20	16,366	-68.9		20	16,145	-59.3	
80	11	17,590	-62.6		22	17,516	-59.8		24	17,646	-64.2		20	17,650	-64.8		10	17,584	-58.9		17	17,701	-68.2		17	17,543	-58.8	
60	8	19,371	-60.9		18	19,321	-59.7		18	19,410	-61.8		15	19,424	-62.4		8	19,387	-59.3		16	19,439	-65.2		10	19,391	-59.2	
50	7	20,524	-59.3		16	20,454	-59.0		16	20,540	-61.5		15	20,552	-60.8		7	20,532	-58.4		15	20,556	-62.8					
40	7	21,925	-58.2		14	21,859	-58.4		14	21,923	-59.5		14	21,952	-57.7						14	21,934	-61.4					
30	5	23,735	-57.0		5	23,716	-55.5		12	23,737	-57.8		12	23,759	-55.8						12	23,729	-57.3					
20									7	26,299	-55.4										5	26,315	-54.7					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

NOVEMBER 1951

Standard pressure surface (mb.)	PORTLAND, MAINE (1015 MB.)				RAPID CITY, S. DAK. (904 MB.)				ST. CLOUD, MINN. (979 MB.)				SAN ANTONIO, TEX. (991 MB.)				SAN JUAN, P. R. (1013 MB.)				SANTA MARIA, CALIF. (1009 MB.)				S. STE. MARIE, MICH. (989 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	20	0.8	81	30	966	- 1.7	67	30	317	- 6.4	81	29	240	14.0	63	30	19	24.8	87	30	71	11.1	83	30	221	- 3.2	77
1,000	30	141	3.0	72	30	146			30	145			29	164			30	128	25.0	82	30	148	13.1	76	30	132		
950	30	559	1.6	68	30	564			30	556	- 4.6	71	29	602	14.0	60	30	588	22.9	77	30	589	13.9	55	30	541	- 4.2	74
900	30	990	- 0.1	63	30	999			30	976	- 4.6	63	29	1,055	12.9	61	30	1,049	19.9	78	30	1,036	12.4	45	30	962	- 6.4	71
850	30	1,447	- 1.4	58	30	1,460	1.0	51	30	1,425	- 5.7	54	29	1,534	11.6	55	30	1,540	16.9	76	30	1,513	10.2	37	30	1,408	- 8.1	63
800	30	1,928	- 3.0	58	30	1,946	- 0.8	51	30	1,899	- 6.6	45	29	2,040	10.3	52	30	2,056	14.1	74	30	2,015	7.9	34	30	1,877	- 9.8	59
750	30	2,445	- 5.0	56	30	2,461	- 2.9	49	30	2,409	- 7.9	42	29	2,582	8.2	46	30	2,605	11.6	61	30	2,551	5.4	32	30	2,376	-11.8	57
700	30	2,978	- 7.1	54	30	3,002	- 6.2	49	30	2,936	-10.3	44	29	3,143	6.2	36	30	3,175	9.0	48	30	3,106	2.5	29	30	2,899	-14.1	52
650	30	3,558	- 9.6	53	30	3,582	- 9.9	46	30	3,512	-13.2	41	29	3,751	3.5	30	30	3,792	5.6	44	30	3,703	- 1.0	27	30	3,462	-16.8	51
600	29	4,165	-12.6	46	30	4,190	-13.7	41	30	4,110	-16.4	38	29	4,393	- 0.1		30	4,435	2.1	45	30	4,335	- 5.0	27	29	4,057	-20.1	47
550	29	4,826	-16.6	42	30	4,849	-17.9	36	30	4,765	-20.4		28	5,085	- 4.4		30	5,137	- 1.9	41	30	5,013	- 9.5	29	29	4,697	23.9	46
500	29	5,533	-21.3	42	30	5,552	-22.6	35	30	5,459	-25.0	39	28	5,827	- 9.2		30	5,886	- 5.7		30	5,742	-14.5	28	29	5,387	-28.1	45
450	29	6,307	-26.5		30	6,317	-28.3	37	30	6,223	-30.1	38	27	6,638	-14.9		30	6,711	-10.6		30	6,538	-20.3		29	6,138	-32.7	
400	29	7,144	-32.2		30	7,150	-34.5	39	30	7,046	-35.7	39	27	7,514	-21.2		30	7,601	-16.7		30	7,394	-27.1		29	6,959	-38.1	
350	28	8,070	-39.1		30	8,070	-41.2		28	7,951	-42.1		27	8,483	-28.7		29	8,591	-23.9		30	8,341	-34.6		29	7,866	-44.0	
300	28	9,113	-45.3		30	9,100	-48.3		28	8,979	-48.5		26	9,569	-36.8		29	9,696	-32.4		30	9,401	-42.4		29	8,887	-49.5	
250	24	10,311	-51.6		29	10,287	-54.6		27	10,157	-54.0		25	10,809	-46.0		29	10,954	-42.4		30	10,610	-50.7		29	10,069	-52.9	
200	23	11,732	-55.6		26	11,693	-56.4		27	11,583	-54.5		25	12,259	-56.3		29	12,422	-54.5		30	12,040	-57.4		29	11,505	-53.4	
175	22	12,587	-57.7		26	12,539	-56.5		27	12,438	-53.9		24	13,093	-61.2		29	13,264	-60.8		30	12,878	-59.9		29	12,364	-53.2	
150	20	13,554	-57.5		24	13,522	-56.7		25	13,432	-54.3		24	14,039	-65.7		29	14,207	-67.5		28	13,843	-62.8		29	13,356	-53.3	
125	18	14,682	-57.0		22	14,672	-57.6		24	14,611	-54.8		20	15,128	-69.0		28	15,287	-73.8		26	14,962	-65.1		28	14,528	-53.6	
100	12	16,087	-58.3		22	16,078	-57.9		21	16,029	-55.7		14	16,451	-71.4		26	16,573	-77.8		24	16,316	-66.3		26	15,962	-55.0	
80	8	17,451	-58.1		22	17,484	-58.0		16	17,453	-56.2		8	17,749	-69.7		24	17,849	-77.3		22	17,660	-65.4		23	17,376	-56.1	
60					18	19,285	-59.2		13	19,279	-56.5		6	19,476	-65.4		21	19,519	-68.9		18	19,424	-63.3		11	19,237	-56.0	
50					16	20,428	-58.6		11	20,429	-56.3		6	20,595	-61.6		16	20,624	-63.2		14	20,571	-61.9		6	20,438	-55.9	
40					11	21,811	-59.1		8	21,863	-55.4		5	21,986	-57.8		8	22,000	-59.3		11	21,953	-59.8					
30													5	23,812	-54.9													

Standard pressure surface (mb.)	SPOKANE, WASH. (932 MB.)				SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1019 MB.)				TATOOSH ISLAND, WASH. (1009 MB.)				TOLEDO, OHIO (995 MB.)				WASHINGTON, D. C. (1011 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	722	1.9	81	30	10	26.3	81	29	2,306	16.6	49	30	9	16.6	83	30	31	8.7	79	30	191	0.9	79	30	88	4.8	65
1,000	30	145			30	123	26.5	79	29	65			30	170	17.3	74	30	102			30	150			30	174	5.5	60
950	30	567			30	582	23.3	80	29	529			30	610	15.6	68	30	531	6.4	71	30	565	0.3	67	30	595	4.6	59
900	30	1,002	2.1	72	30	1,047	20.2	80	29	1,006			30	1,065	13.4	62	30	967	3.8	71	30	996	- 1.7	64	30	1,033	3.4	57
850	30	1,462	0.9	63	30	1,539	17.2	80	29	1,501			30	1,545	11.2	58	30	1,429	1.1	71	30	1,451	- 2.2	59	30	1,496	2.1	50
800	30	1,948	- 1.3	58	30	2,056	14.8	72	29	2,033			30	2,050	10.0	46	30	1,914	- 1.2	64	30	1,931	- 3.8	56	30	1,984	0.5	46
750	30	2,466	- 3.7	58	30	2,601	12.4	60	29	2,588	15.3	47	30	2,595	8.3	40	30	2,435	- 3.5	51	30	2,446	- 6.2	50	30	2,505	- 1.0	43
700	30	3,003	- 6.2	55	30	3,177	9.9	51	29	3,162	11.5	51	30	3,152	6.7		30	2,969	- 6.4	47	30	2,976	- 8.4	48	30	3,049	- 2.9	43
650	30	3,583	- 9.6	55	30	3,794	7.0	43	29	3,784	6.9	57	30	3,768	4.0		30	3,552	- 9.8	47	30	3,558	-10.9	48	30	3,635	- 5.7	43
600	30	4,192	-13.2	54	30	4,445	3.4	37	29	4,430	2.1	62	30	4,405	0.4		30	4,159	-14.0	47	30	4,161	-13.9	46	30	4,256	- 9.1	45
550	30	4,853	-17.6	51	30	5,146	- 0.6	32	29	5,135	- 1.7	47	30	5,101	- 4.0	25	30	4,821	-17.5	47	30	4,821	-17.4	44	30	4,926	-12.8	41
500	30	5,555	-22.2	46	30	5,901	- 5.3		28	5,882	- 5.6	30	30	5,842	- 9.2		30	5,523	-22.2	47	29	5,524	-21.9	42	30	5,645	-16.9	37
450	30	6,324	-27.5	47	27	6,725	-10.4		28	6,712	-10.6		30	6,657	-14.6		30	6,296	-27.8	48	29	6,296	-27.1		30	6,432	-22.0	34
400	30	7,159	-33.5	47	27	7,617	-16.7		28	7,599	-16.4		30	7,530	-20.9		30	7,125	-33.8	49	29	7,130	-32.8		30	7,285	-28.3	37
350	30	8,082	-40.0		27	8,606	-23.8		28	8,588	-23.8		30	8,502	-28.3		30	8,048	-40.4		29	8,058	-39.0		30	8,228	-35.3	39
300	30	9,117	-47.1		27	9,712	-32.2		27	9,695	-32.6		30	9,588	-36.7		30	9,082	-47.4		29	9,099	-46.0		30	9,284	-42.9	
250	29	10,307	-53.9		27	10,972	-42.3		27	10,954	-42.7		30	10,825	-46.2		30	10,269	-53.6		29	10,292	-52.8		30	10,491	-50.9	
200	28	11,727	-57.0		27	12,441	-54.3		25	12,424	-54.9		28	12,275	-56.6		26	11,683	-56.4		29	11,717	-56.4		29	11,918	-58.1	
175	28	12,573	-55.8		25	13,283	-60.9		17	13,270	-61.4		27	13,112	-61.4		25	12,530	-56.4		28	12,572	-57.1		29	12,754	-60.3	
150	28	13,555	-55.4		22	14,227	-68.0		9	14,204	-68.9		26	14,057	-66.0		25	13,506	-57.0		28	13,546	-57.2		26	13,705	-60.5	
125	26	14,721	-56.6		21	15,306	-74.4		8	15,286	-74.7		26	15,150	-70.1		24	14,663	-57.6		28	14,697	-57.9		23	14,818	-61.2	
100	23	16,137	-57.1		18	16,587	-78.4		6	16,566	-78.7		24	16,470	-72.9		20	16,081	-57.4		25	16,103	-59.8		20	16,196	-61.5	
80	22	17,542	-56.4		16	17,853	-78.9						21	17,779	-71.6		16	17,479	-56.5		21	17,509	-59.8		16	17,569	-60.7	
60	20	19,369	-56.8		14	19,516	-70.5						18	19,508	-65.8		11	19,294	-56.0		6	19,319	-58.8		12	19,357	-58.3	
50	16	20,527	-56.6		14	20,616	-64.1						17	20,624	-62.7		10	20,464	-54.1						10	20,506	-58.5	
40	7	21,974	-55.6		14	21,993	-59.9						16	22,008	-58.5		7	21,891	-53.7						9	21,927	-56.5	
30					11	23,796	-55.6						14	23,836	-54.6										8	23,761	-55.4	
20					10	26,398	-51.2						9	26,450	-50.9													

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1946, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

Table 21

PILOT BALLOON DATA

Average monthly resultant winds

NOVEMBER 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	29	236	1.8	30	295	1.8	30	265	4.0	30	294	2.4	29	126	1.1	29	108	2.2
500	--	---	----	--	---	----	--	---	----	--	---	----	--	---	----	28	141	3.8
1,000	27	231	4.6	--	---	----	--	---	----	28	277	5.5	29	137	1.9	22	161	2.7
1,500	27	239	5.3	--	---	----	30	255	9.3	24	286	7.9	28	153	3.3	19	203	2.1
2,000	27	260	7.1	30	296	2.6	30	272	9.9	22	286	10.2	24	215	3.5	16	230	2.7
2,500	26	262	8.5	29	290	4.9	27	280	11.2	20	289	11.3	22	245	6.1	13	239	4.0
3,000	23	277	10.3	29	287	7.9	23	275	13.5	20	287	13.3	18	259	7.4	13	263	5.3
4,000	20	287	13.7	25	298	10.4	20	282	16.6	18	295	17.3	14	266	8.2			
5,000	17	286	13.4	25	294	14.0	16	288	16.5	15	290	18.0	11	289	10.6			
6,000	15	293	15.7	24	292	16.5	14	297	18.5	14	292	23.1	10	297	13.2			
8,000				17	272	15.8												
10,000				15	270	23.7												

Altitude (meters) m.s.l.	Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	239	3.4	27	191	1.5	29	274	1.1	25	223	2.7	30	265	2.1	30	48	0.4
500	30	244	5.8	27	213	4.0	28	273	2.4	25	219	4.0	--	---	----	--	---	----
1,000	24	248	10.1	22	224	7.0	27	275	3.9	25	249	6.7	--	---	----	--	---	----
1,500	21	249	10.2	16	233	8.4	26	283	5.5	19	262	9.5	30	264	2.8	--	---	----
2,000	14	256	14.1	10	270	9.0	23	292	6.9	15	271	10.7	30	268	3.9	30	39	.2
2,500	12	257	15.4	10	279	11.8	21	283	8.4	12	277	11.4	30	270	6.0	30	231	1.1
3,000	11	264	16.4	10	278	14.4	21	269	9.8	11	281	13.1	30	272	9.7	26	254	2.6
4,000	11	265	20.8				19	263	14.1	11	280	14.9	27	279	15.0	22	276	8.1
5,000							18	264	17.4	10	295	17.3	27	277	15.9	19	285	10.7
6,000							14	267	16.2				26	277	18.7	18	292	12.9
8,000							11	279	19.5				18	272	24.6	12	290	12.9
10,000													14	275	26.9			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Little Rock, Ark. (88 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	317	1.6	27	318	2.0	29	250	2.4	29	13	2.0	25	255	2.4	27	223	1.3
500	--	---	----	27	22	2.1	--	---	----	29	38	1.2	25	255	3.9	27	234	2.5
1,000	--	---	----	26	274	4.3	29	250	6.0	29	229	.4	21	257	7.0	23	230	5.0
1,500	30	317	1.6	24	271	5.7	24	264	10.9	26	282	1.9	19	264	10.1	20	273	6.9
2,000	30	276	1.7	23	282	7.3	23	278	12.1	22	276	2.7	18	267	10.3	18	283	8.5
2,500	29	230	3.1	21	288	9.9	22	282	14.0	20	284	3.6	16	275	12.6	17	277	9.9
3,000	26	258	4.2	21	280	12.1	21	284	14.4	18	278	4.2	15	278	14.3	17	277	12.3
4,000	19	309	6.6	20	284	14.3	16	277	14.7	17	281	8.4	12	282	17.2	12	296	14.8
5,000	17	306	12.3	16	280	18.6				15	286	11.8				10	295	16.1
6,000	14	306	15.7	12	284	19.4				14	280	14.9						
8,000																		

Altitude (meters) m.s.l.	Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	25	308	0.9	30	62	3.0	28	13	1.2	26	240	0.9	29	227	1.5	25	205	3.3
500	25	254	.3	30	60	4.9	28	324	.7	26	230	2.5	26	222	1.0	25	209	3.5
1,000	25	176	2.7	30	57	3.3	26	307	1.3	22	215	3.9	23	277	1.1	25	209	4.4
1,500	21	195	4.5	29	35	1.1	21	327	4.7	18	257	4.6	22	285	1.5	25	238	6.4
2,000	15	201	3.4	29	281	2.0	17	326	4.5	17	263	8.3	20	280	1.8	23	261	8.5
2,500	14	224	4.2	26	275	4.4	15	325	2.9	16	271	11.6	19	306	2.1	23	277	9.5
3,000	13	238	4.2	24	275	4.0	13	292	4.1	16	281	13.1	18	301	1.9	23	279	10.7
4,000	11	237	8.1	23	272	4.9				16	275	15.4	18	290	3.1	19	281	11.9
5,000				20	260	8.4				13	288	16.3	15	273	3.3	18	290	14.1
6,000				18	264	11.5				10	300	19.6	14	301	3.8	14	286	13.8
8,000				15	272	18.1							11	322	6.1			

Altitude (meters) m.s.l.	Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	268	1.3	30	15	0.4	30	337	2.5	26	289	1.4	26	219	1.6	28	175	0.9
500	30	262	1.9	30	61	.3	--	---	----	26	264	2.4	26	232	3.6	28	174	1.4
1,000	28	254	4.8	30	130	1.0	30	333	2.9	25	262	5.3	25	258	5.4	28	208	2.5
1,500	27	261	6.8	29	153	1.5	29	310	6.1	22	268	8.1	23	262	8.0	26	225	3.7
2,000	25	274	8.3	29	210	1.5	25	285	8.3	22	277	10.1	20	274	9.2	25	245	5.4
2,500	23	286	10.7	26	276	2.2	23	285	10.3	20	276	12.3	19	282	11.5	23	271	7.6
3,000	22	290	12.5	26	283	4.3	20	281	10.9	20	281	14.9	18	288	12.3	23	271	11.3
4,000	18	286	14.6	23	274	8.0	18	292	13.0	19	288	19.0	17	286	12.5	22	275	14.6
5,000	16	285	17.2	22	283	9.7	15	296	15.0	18	293	20.1	15	289	14.4	18	275	19.5
6,000	15	292	18.5	19	272	10.3	12	298	18.2	18	294	23.8	13	287	18.0	11	276	19.5
8,000	10	295	17.9	17	261	14.8												
10,000																		
12,000																		

Altitude (meters) m.s.l.	San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	259	2.3	25	263	1.6	26	190	2.3	26	179	1.7	28	301	2.5
500	29	281	1.8	25	258	2.9	26	193	5.1	--	---	----	28	293	4.2
1,000	28	259	.4	21	282	4.9	19	184	5.5	26	190	3.9	27	276	5.7
1,500	26	74	.3	15	275	6.4	16	197	5.9	24	211	6.6	26	276	7.3
2,000	25	290	1.2	11	283	7.2	14	206	6.1	20	229	7.4	21	283	8.9
2,500	25	289	2.5				13	215	6.8	18	240	8.3	19	282	12.4
3,000	25	287	3.9				11	242	6.6	15	247	8.3	16	278	12.7
4,000	23	274	4.9							13	260	9.4	14	284	15.3
5,000	21	278	5.1										14	276	17.2
6,000	21	283	5.9										12	282	19.2
8,000	17	266	10.1												
10,000	13	259	10.9												
12,000	11	262	18.5												

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No of observations	Direction	Speed	No. of observations	Direction	Speed	No of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	209	0.3	30	142	3.5	30	291	1.6	30	84	1.0	30	53	2.5	30	268	2.8	30	330	0.7	30	C	0.0	30	30	1.1	30	23	0.8	29	308	2.1	30	238	1.9
500	--	---	---	--	---	----	--	---	----	30	135	4.0	30	36	2.3	30	268	5.8	28	246	1.5	30	245	2.3	--	---	----	29	255	.5	27	296	2.7	29	252	2.6
1,000	--	---	---	30	173	3.9	30	295	6.0	30	153	4.1	30	15	1.5	30	267	6.8	28	226	2.8	30	263	4.5	--	---	----	29	247	3.2	27	255	3.4	28	276	6.1
1,500	--	---	---	30	243	3.7	29	300	6.9	30	194	3.4	30	299	1.7	29	261	7.4	25	228	4.2	30	276	6.1	30	27	1.1	29	250	5.4	25	260	4.6	28	287	6.4
2,000	30	304	2.7	29	275	6.2	29	298	8.9	30	221	3.1	30	271	2.8	29	257	9.0	25	235	6.0	30	276	7.8	30	272	1.8	29	256	8.6	26	265	7.4	28	290	7.3
2,500	30	291	5.6	29	274	8.4	29	297	10.5	30	242	4.3	30	252	4.7	29	257	11.3	25	248	7.5	30	281	8.8	30	246	3.7	28	256	10.7	24	258	9.2	27	284	8.0
3,000	30	288	7.2	29	277	10.3	29	301	12.2	30	273	5.6	30	256	6.6	28	257	13.3	27	257	10.4	30	284	10.1	29	259	5.3	28	255	13.0	25	259	11.4	28	288	9.1
4,000	30	294	10.1	27	288	12.6	27	299	13.8	30	278	7.6	27	258	9.0	28	257	16.1	27	258	14.4	30	282	12.8	30	276	7.8	28	258	16.1	23	266	14.3	26	295	12.3
5,000	29	283	13.5	23	279	14.5	26	301	15.1	30	277	10.3	24	252	11.3	26	251	19.4	28	260	17.5	28	273	14.7	30	290	12.6	28	261	18.9	24	265	20.3	23	297	15.4
6,000	26	279	15.3	19	271	15.8	25	304	16.5	29	273	12.5	23	260	13.8	24	249	22.1	26	269	19.2	28	273	18.4	26	283	13.4	24	267	22.7	19	267	18.6	21	298	16.2
8,000	18	285	14.8	14	276	21.3	22	298	15.9	27	266	19.0	23	264	19.0	18	249	23.6	23	270	25.2	25	269	24.1	19	278	13.8	19	266	25.6	16	261	21.6	17	304	17.6
10,000	17	279	19.1				16	284	15.8	17	268	21.7	21	266	24.5	14	266	28.4	19	268	27.9	17	264	30.9	14	298	16.3	15	271	29.3	12	265	25.5	14	310	16.4
12,000	13	271	25.6				12	283	20.3	14	280	26.8	14	273	30.3				17	270	32.0				12	289	22.5									
14,000																			16	269	27.3															
16,000																			12	262	21.5															

	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
Surface	29	252	0.1	30	166	1.3	30	21	2.1	30	312	1.9	29	278	0.8	30	195	0.6	29	180	0.4	30	326	1.8	30	76	1.3	29	164	1.2	30	266	1.0	30	83	0.6
500	28	198	2.5	28	160	1.7	30	64	4.8	29	268	6.4	29	215	1.1	29	248	1.6	26	344	.6	--	---	----	30	121	3.0	29	100	7.2	30	263	2.2	30	360	1.6
1,000	28	237	5.8	28	188	3.1	30	77	3.5	29	257	8.5	26	266	2.4	28	267	2.0	26	285	2.4	30	318	2.0	30	180	2.7	29	94	6.9	30	281	6.3	30	9	2.1
1,500	28	258	8.4	27	211	4.4	30	136	1.2	28	249	10.4	26	273	5.9	28	256	2.5	25	272	4.7	30	295	6.9	30	228	4.6	29	94	6.2	29	292	8.6	30	354	1.6
2,000	28	260	9.1	27	233	6.5	30	235	2.0	29	249	12.7	26	272	9.2	29	263	3.3	26	274	5.6	30	301	9.6	30	250	6.5	29	91	5.8	29	296	10.0	30	317	2.1
2,500	27	266	10.3	27	238	8.3	30	246	3.9	28	251	14.5	26	268	10.2	29	277	3.9	26	284	7.2	29	303	11.2	30	262	7.8	29	89	5.5	29	293	11.8	30	308	4.0
3,000	26	273	12.8	26	246	9.2	30	257	4.7	28	250	17.3	26	266	13.4	29	284	5.7	25	276	8.8	28	300	11.5	30	272	9.9	29	90	5.1	29	296	13.1	30	307	4.8
4,000	19	279	12.1	24	265	10.8	30	263	5.7	25	255	19.6	23	272	14.0	28	286	6.4	23	276	11.6	28	298	12.6	30	274	12.5	29	94	3.7	26	291	15.2	30	290	6.5
5,000	16	281	14.8	20	267	9.2	29	263	8.5	22	255	24.7	22	271	20.3	28	281	9.1	23	276	14.7	27	288	13.4	29	275	15.2	29	64	1.9	24	292	16.1	30	274	7.9
6,000	15	284	16.6	17	287	9.2	29	265	11.9	17	262	22.4	17	279	19.8	25	271	7.6	23	268	17.4	27	291	15.7	25	272	16.3	29	49	3.2	20	296	18.0	27	278	7.9
8,000	11	301	18.4	15	304	10.3	28	272	17.0	13	260	25.3	11	281	22.6	23	277	11.8	18	266	20.4	26	286	19.5	18	265	21.4	28	354	3.3	14	286	19.8	25	287	7.6
10,000				10	296	19.5	28	276	20.4	12	273	30.5				19	309	10.5	14	269	27.4	20	290	20.6	12	270	29.8	28	315	6.6				24	271	11.2
12,000							22	279	21.8							12	283	17.0	11	277	28.1	17	287	25.8				28	298	12.2				23	266	14.5
14,000							18	287	24.0													11	281	21.0				28	286	16.2				21	263	16.6
16,000																						10	275	20.1				26	294	12.7				18	282	11.6
18,000																												21	290	4.7				17	285	8.1
20,000																												14	348	.5				12	346	4.1

	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)			Washington, D.C. (88 m.)		
Surface	30	120	0.3	29	131	1.1	30	120	3.5	30	290	1.1
500	30	245	2.2	--	---	----	29	178	4.2	27	290	3.1
1,000	30	268	3.9	29	183	4.0	28	204	5.6	25	280	5.1
1,500	29	277	5.7	28	219	5.4	27	225	5.8	25	266	6.8
2,000	29	276	7.6	28	244	6.6	27	235	5.7	25	257	8.7
2,500	29	274	8.5	28	259	7.4	27	240	7.2	27	252	11.9
3,000	29	273	8.7	28	265	8.6	27	242	8.4	27	250	14.4
4,000	24	279	10.1	27	274	9.9	28	253	10.9	26	249	18.5
5,000	22	273	12.2	28	278	13.6	27	255	13.0	23	258	19.9
6,000	19	278	13.7	25	293	13.5	25	260	14.4	18	255	22.6
8,000	14	267	14.4	19	279	16.5	18	270	16.4	11	268	22.7
10,000				13	300	16.9	14	274	16.8			

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30.—Solar radiation intensities, tabulated in langleys per minute.

Date	Sun's zenith distance									Vapor pressure, E.S.T.	
	A. M.				0.0°	P. M.					
	78.7°	75.7°	70.7°	60.0°		60.0°	70.7°	75.7°	78.7°	7:30 a. m.	1:30 p. m.
TABLE MOUNTAIN, CALIF.											
	Air mass										
	3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
November										Mb.	Mb.
1	----	----	----	1.60	----	----	----	----	----		
2	----	----	----	1.61	----	----	----	----	----		
3	----	----	----	1.62	----	----	----	----	----		
4	----	----	----	1.61	----	----	----	----	----		
9	----	----	----	1.63	----	----	----	----	----		
18	----	----	----	1.63	----	----	----	----	----		
27	----	----	----	1.61	----	----	----	----	----		
28	----	----	----	1.63	----	----	----	----	----		
29	----	----	----	1.63	----	----	----	----	----		
Averages	----	----	----	1.62	----	----	----	----	----		
Departures	----	----	----	+.09	----	----	----	----	----		
LINCOLN, NEBR.											
	Air mass										
	4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
November										Mb.	Mb.
2	----	----	1.18	1.24	----	1.24	1.15	1.04	0.96	1.3	1.6
8	0.92	1.00	1.12	1.26	----	----	----	----	----	4.8	6.4
9	----	----	----	----	----	1.24	1.09	.94	.81	4.8	5.8
10	.90	1.01	1.12	1.27	----	1.27	1.12	.96	.88	4.4	6.9
14	----	----	1.18	1.31	----	1.31	1.18	1.09	1.01	5.1	4.8
19	----	----	----	----	----	----	1.09	.96	.85	2.6	3.3
Averages	.91	1.01	1.15	1.27	----	1.27	1.13	1.00	.90		
Departures	+.02	.00	-.01	-.08	----	-.05	-.03	-.02	.00		
MADISON, WIS.											
	Air mass										
	4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
November										Mb.	Mb.
1	0.98	1.07	1.18	1.34	----	----	----	----	----	3.0	3.5
5	.81	.92	1.13	1.28	----	----	----	----	----	1.1	2.2
9	.69	.79	.87	1.18	----	----	----	----	----	4.8	6.4
10	.95	1.07	1.16	----	----	----	----	----	----	5.8	7.2
18	.49	.66	.87	----	----	----	----	----	----	2.3	2.1
24	1.03	1.14	1.24	----	----	----	----	----	----	1.5	1.8
28	.84	.94	1.01	----	----	----	----	----	----	4.4	6.1
Averages	.83	.94	1.07	1.27	----	----	----	----	----		
Departures	-.02	-.03	-.05	-.02	----	----	----	----	----		
BOSTON, MASS.											
	Air mass										
	4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
November										Mb.	Mb.
	RECORDER INOPERATIVE 1ST TO 21ST										
27	0.90	1.02	1.09	----	----	----	1.24	1.14	1.02	2.5	2.1
Averages	.90	1.02	1.09	----	----	----	1.24	1.14	1.02		
Departures	+.15	+.19	+.19	----	----	----	+.24	+.27	+.26		
TACUBAYA, D. F., MEXICO											
	Air mass										
	3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83		
November										Mb.	Mb.
5	----	----	0.88	0.81	----	----	----	----	----	11.2	10.7
8	----	----	.53	.74	----	0.78	0.55	----	----	9.9	9.9
9	0.46	----	----	.79	----	1.04	.88	0.72	0.50	7.7	6.1
10	----	----	.85	1.16	----	.88	----	----	----	7.6	4.8
12	----	----	----	.68	----	.70	.54	.41	.40	7.6	7.9
13	----	----	----	1.01	----	.66	.66	.26	.25	10.3	9.9
14	----	----	.43	.50	----	.64	.77	.64	.54	11.4	11.9
15	.37	0.40	.61	.71	----	1.08	.83	----	.69	10.1	8.5
16	----	----	.69	.87	----	.89	.59	----	----	9.9	8.4
19	----	----	.59	.88	----	----	----	----	----	9.6	9.3
21	----	----	.60	.99	----	1.12	1.01	.89	.85	8.4	6.3
22	----	----	1.06	1.08	----	1.07	.94	.86	.66	5.3	3.9
24	----	----	.62	----	----	----	----	----	----	5.4	6.7
26	----	----	.86	1.02	----	.87	----	----	----	11.6	10.5
27	----	----	----	----	----	.71	.35	----	.22	11.4	11.1
29	----	----	----	----	----	.68	.54	.38	.30	8.9	10.5
30	----	----	----	----	----	.50	.39	.17	.17	8.5	10.1
Averages	.41	.40	.70	.86	----	.83	.67	.54	.46		
Departures	-.24	-.41	-.16	-.10	----	-.26	-.26	-.26	-.20		
BLUE HILL, MASS.											
	Air mass										
	4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
November										Mb.	Mb.
4	----	1.06	1.19	1.24	----	1.15	----	----	----	3.9	6.6
5	----	----	----	----	----	----	----	0.81	0.70	2.9	2.5
8	0.89	.97	1.06	----	----	----	----	----	----	10.4	5.2
9	.82	.97	1.14	1.38	----	1.39	1.22	1.11	----	3.2	4.0
11	----	----	1.00	1.18	----	1.11	----	----	----	5.5	5.0
12	----	----	----	1.27	----	----	----	----	----	3.9	5.8
15	.96	1.08	1.23	----	----	----	----	----	----	14.1	6.5
21	1.08	1.18	1.30	----	----	----	1.29	1.19	1.07	2.1	1.3
25	----	1.17	1.29	----	----	----	1.28	1.18	1.07	2.5	2.5
27	.97	1.08	1.22	----	----	----	1.30	1.18	1.08	2.3	1.0
Averages	.94	1.07	1.18	1.27	----	1.22	1.27	1.09	.98		
Departures	+.05	+.07	+.07	.00	----	-.03	+.16	+.12	+.13		
	RATIO BOSTON/BLUE HILL ON COMPARABLE DATES										
	.93	.94	.89	----	----	----	.95	.97	.94		
ALBUQUERQUE, N.M.											
	Air mass										
	4.08	3.26	2.44	1.63	*0.815	1.63	2.44	3.26	4.08		
November										Mb.	Mb.
1	----	----	----	----	----	----	----	----	0.94	5.6	4.6
2	1.10	1.23	1.37	1.50	----	1.56	1.26	1.18	1.09	1.8	1.3
3	1.10	1.20	1.33	1.44	----	1.55	1.31	1.21	1.07	.8	1.0
4	1.08	1.20	1.32	1.46	----	1.50	1.35	1.22	1.10	1.8	2.4
	RECORDER INOPERATIVE 5TH TO 17TH										
18	----	1.10	1.24	1.41	----	1.44	1.25	1.14	1.05	1.8	2.9
19	1.14	1.24	1.39	1.57	----	1.43	1.27	1.08	.99	2.4	2.5
20	1.09	1.18	1.31	1.37	----	1.35	1.31	1.16	1.03	2.6	4.2
22	----	1.10	1.24	1.44	----	1.45	1.26	1.12	1.02	5.8	4.4
23	1.02	1.13	1.26	1.44	----	----	----	----	----	3.0	3.8
24	----	----	1.24	----	----	----	----	1.26	1.17	5.2	5.4
25	1.14	----	----	----	----	1.52	1.35	1.25	1.14	2.5	3.3
26	1.10	1.22	1.35	1.53	----	1.52	1.32	1.21	1.13	2.6	2.4
27	1.25	1.31	1.42	1.59	----	1.49	1.43	1.32	1.24	2.4	2.6
28	1.15	1.25	1.36	1.53	----	1.44	1.32	1.25	1.13	2.3	2.5
29	1.16	1.24	1.38	1.51	----	1.52	1.30	1.07	.92	2.3	2.9
30	1.09	1.21	1.33	1.48	----	1.53	----	----	----	2.3	3.0
Averages	1.12	1.20	1.32	1.48	----	1.48	1.31	1.17	1.07		
Departures	+.10	+.07	+.08	+.09	----	+.09	+.07	+.05	+.05		

*Extrapolated

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	29	30	31	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	491	46	154	2	32	(139)	473	(191)	299	311	2	294	518	233	416	296	478	184	115	284	8	24	398	213
Date	19	20	21	22	23	24	25	Average	26	27	28	29	30	1	2	Average								
Langleys	384	170	509	(170)	157	---	522	(319)	55	524	219	257	375	426	353	316								

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	29	30	31	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	59	45	55	11	29	(35)	51	(41)	58	62	12	48	(46)	--	--	45	--	--	--	--	--	--	49	---
Date	19	20	21	22	23	24	25	Average	26	27	28	29	30	1	2	Average								
Langleys	48	53	46	44	45	15	45	42	27	35	54	43	39	39	49	41								

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	29	30	31	1	2	3	4	Average	5	6	7	8	9	10	11	Average	12	13	14	15	16	17	18	Average
Langleys	75	69	107	2	54	45	56	58	85	126	2	76	41	102	68	71	57	96	74	60	15	26	76	58
Date	19	20	21	22	23	24	25	Average	26	27	28	29	30	1	2	Average								
Langleys	77	107	41	41	89	57	36	64	48	41	99	81	57	53	84	66								

Note.—Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.

1951	Aklavik, MacKenzie	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Barrow, Alaska	Big Spring, Tex.	Blue Hill, Mass.	Boston, Mass.	Brownsville, Tex.	Canton Is.,Pac.Area	Caribou, Me.	Charleston, S.C.	Cleveland, Ohio	Columbia, Mo.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.
October 29---	19	(359)		444	381	9	426	331	378	515	---	154	405	319	69	197	340	(336)
October 30---	58	192		447	98	5	274	69	104	520	---	165	185	275	224	180	320	293
October 31---	55	382		428	---	11	304	159	178	502	---	57	395	129	46	121	290	80
November 1---	--	235		155	47	2	114	2	(45)	152	---	43	193	65	113	178	294	182
November 2---	28	450		83	61	6	318	54	59	179	---	309	67	20	331	40	281	(442)
November 3---	32	432		483	409	11	---	(112)	(88)	519	---	8	438	263	177	276	319	406
November 4---	11	419		318	416	7	409	305	---	417	---	134	379	236	159	156	308	346
Averages------	34	(353)		337	235	7	307	(147)	(142)	401	---	124	295	187	160	164	307	(298)
Departures----	-2	-34		-55	---	--	---	-57	-13	-11	---	-14	-24	+14	-67	---	---	---
November 5---	46	442		457	419	2	384	180	(186)	267	---	208	419	283	113	195	302	259
November 6---	8	427		76	46	2	437	236	218	415	(557)	300	108	57	102	---	299	374
November 7---	6	421		460	187	2	418	2	3	496	504	46	367	25	402	---	257	(399)
November 8---	9	396		456	427	2	408	178	198	327	560	60	410	63	370	263	305	(347)
November 9---	7	396		458	416	2	411	299	302	(241)	507	117	428	267	259	---	298	370
November 10---	15	364		284	374	1	320	180	(191)	---	537	63	342	263	312	---	113	363
November 11---	8	88		395	462	1	127	258	---	431	602	34	405	(175)	192	---	106	134
Averages------	14	362		369	333	2	358	191	(183)	(362)	(544)	118	354	(162)	250	---	240	(321)
Departures----	-5	-1		-9	---	--	---	+9	+34	-12	---	-6	+31	+6	+40	---	---	---
November 12---	40	187		398	121	1	334	267	274	409	567	207	333	97	208	---	269	295
November 13---	30	278		365	143	2	330	128	167	374	630	71	364	51	100	---	227	340
November 14---	9	144		365	60	1	378	93	126	425	510	39	350	228	348	---	272	350
November 15---	10	332		152	95	1	352	173	(186)	429	512	170	108	264	66	---	313	(111)
November 16---	14	403		161	117	1	201	15	27	221	594	23	105	33	84	---	300	278
November 17---	6	358		263	238	T	361	26	46	320	696	58	207	145	140	---	280	356
November 18---	23	370		432	389	1	356	211	(215)	335	681	114	387	95	352	---	214	347
Averages------	19	296		305	166	1	330	130	(149)	359	598	97	265	130	185	---	268	(300)
Departures----	+7	-41		-52	---	--	---	-33	+5	+28	---	-22	-32	-2	-10	---	---	---
November 19---	7	374		391	390	T	378	201	226	59	561	173	387	94	321	---	106	340
November 20---	4	362		405	361	T	382	124	180	167	612	(166)	390	119	298	---	97	306
November 21---	3	218		310	362	T	344	250	(198)	(222)	546	154	383	266	220	---	186	223
November 22---	3	357		390	327	T	95	152	164	313	608	92	282	61	78	---	265	263
November 23---	4	346		342	169	T	273	127	133	376	468	26	248	22	45	---	280	312
November 24---	2	201		335	256	T	134	23	22	322	677	190	203	151	190	---	201	83
November 25---	3	314		291	245	0	58	260	222	367	563	196	88	64	39	49	119	168
Averages------	4	310		352	302	T	238	162	(164)	(261)	576	(142)	283	111	170	---	179	242
Departures----	-3	-13		+18	---	--	---	+16	+52	-50	---	+22	-3	-4	-19	---	---	---
November 26---	2	357		298	208	0	85	58	91	174	652	47	223	45	163	42	56	227
November 27---	3	359		291	87	0	306	255	253	321	618	143	233	121	303	105	96	278
November 28---	3	346		106	264	0	362	175	114	408	528	181	32	141	298	---	134	302
November 29---	3	345		364	332	0	271	162	114	257	565	183	349	193	281	---	140	297
November 30---	2	335		346	276	0	256	195	151	172	549	188	329	184	289	---	86	306
December 1---	3	316		128	254	0	214	209	163	(297)	630	144	243	203	218	190	59	260
December 2---	3	183		127	266	0	328	185	155	375	563	73	213	119	102	175	177	(296)
Averages------	3	320		237	241	0	260	177	148	(286)	586	137	232	144	236	128	107	(281)
Departures----	-1	+5		-61	---	--	---	+29	+45	-46	---	+20	-22	+33	+39	---	---	---
Accumulated Departures January 1 to December 2, 1951	-658	+875		+273	---	---	---	-385	+2373	---	---	---	---	---	---	---	---	---

1951	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Tex.	Fairbanks, Alaska	Ft. Worth, Tex.	Fresno, Calif.	Gainesville, Fla.	Glasgow, Mont.	Grand Junction,Colo	Greensboro, N.C.	Griffin, Ga.	Hatteras, N.C.	Honolulu, T.H.	Indianapolis, Ind.	Ithaca, N.Y.	Keflavik, Iceland	Lake Charles, La.	Las Vegas, Nev.
October 29---	255	331	91	469	65	429	399		120	388	399	412	407	213	178	197		243	399
October 30---	243	131	152	121	72	427	303		276	376	169	55	75	180	241	148		442	233
October 31---	170	225	199	480	37	85	355		318	324	184	212	403	526	79	117		392	386
November 1---	226	19	196	463	60	69	299		275	294	139	41	277	458	242	80		127	375
November 2---	85	57	47	477	48	322	354		194	388	112	43	166	521	127	54		64	401
November 3---	154	49	75	401	68	477	348		275	373	421	421	119	376	246	60		464	379
November 4---	191	261	100	457	44	465	342		215	335	459	411	311	463	320	304		459	364
Averages------	189	153	123	410	56	325	343		239	354	269	228	251	391	205	137		313	362
Departures----	+42	-43	+2	-24	+10	-31	+18		+32	---	---	-53	-60	-71	-2	-25		-42	-2
November 5---	241	225	120	446	16	147	351		238	365	442	414	405	390	176	245		248	378
November 6---	34	250	108	466	13	468	345		352	374	186	49	170	346	15	192		461	369
November 7---	11	19	145	453	75	467	344		242	364	228	203	156	508	83	41		465	331
November 8---	109	183	174	434	18	445	312		293	320	446	434	405	417	307	61		463	335
November 9---	189	286	145	414	44	425	306		222	335	437	414	400	402	212	229		408	341
November 10---	221	221	35	379	18	418	304		178	332	426	353	351	459	214	229		227	215
November 11---	209	238	34	143	13	217	219		140	196	418	430	357	436	231	115		401	312
Averages------	145	203	109	391	28	370	312		238	326	365	328	320	423	177	159		382	326
Departures----	+34	+24	-2	-27	-7	+3	+25		+45	---	---	+33	+23	+6	-23	+21		+19	-16
November 12---	42	256	84	423	20	395	243		197	50	314	201	324	449	28	224		196	322
November 13---	4	107	71	401	35	406	322		88	225	205	161	279	408	4	169		189	328
November 14---	129	154	70	436	27	(392)	273		116	98	234	43	244	507	258	27		305	269
November 15---	180	135	93	308	43	(401)	161		154	277	271	112	213	514	155	230		303	330
November 16---	70	32	151	241	15	327	282		165	334	175	153	245	523	64	12		362	315
November 17---	117	45	99	91	11	(429)	327		164	331	397	317	67	374	166	33		441	328
November 18---	103	249	116	401	9	(427)	321		293	325	412	390	381	494	120	172		405	318
Averages------	92	140	98	329	23	---	276		168	234	287	197	251	467	114	124		314	316
Departures----	-11	-30	-6	-59	-5	---	+28		-6	---	---	-86	-24	+38	-55	+5		-28	00
November 19---	183	262	77	398	19	421	37		191	304	390	393	378	371	254	138		371	251
November 20---	160	209	88	399	6	399	137		200	284	442	366	375	488	241	104		405	281
November 21---	166	264	105	366	7	149	168		188	112	424	355	370	333	202	260		348	260
November 22---	6	178	103	347	18	174	259		87	220	385	336	354	494	23	41		242	234
November 23---	43	184	86	228	4	(83)	321		94	204	344	185	184	521	30	4		215	82
November 24---	190	22	111	373	7	48	287		104	144	232	275	302	490	171	85		351	212
November 25---	58	241	85	216	(28)	134	313		176	260	114	255	131	462	24	212		241	285
Averages------	115	194	94	332	(13)	(201)	217		149	218	333	309	299	441	135	121		310	229
Departures----	+27	+50	-2	-31	-3	-105	-13		+2	---	---	+41	+36	-13	-9	+8		-4	-65
November 26---	61	97	93	391	6	66	140		116	283	231	139	122	453	111	24		238	229
November 27---	195	241	81	377	16	223	292		186	188	274	86	186	453	149	110		82	275
November 28---	50	181	70	386	7	360	259		77	202	307	245	89	492	211	82		235	290
November 29---	125	108	59	291	8	380	279		143	171	397	337	252	472	197	102		366	285
November 30---	152	174	97	366	4	168	265		161	183	351	258	326	370	174	195		86	224
December 1---	150	189	52	352	6	138	41		107	201	300	229	324	412	194	128		262	210
December 2---	131	172	95	362	4	293	255		77	105	328	266	301	429	87	45		332	196
Averages------	124	166	78	361	7	233	219		124	190	313	223	228	440	160	98		229	244
Departures----	+31	+28	-6	+13	-4	-43	+17		-10	---	---	-7	-15	+37	+15	+4		-49	-29
Accumulated Departures January 1 to December 2, 1951	-4536	-3633	---	---	---	---	---		---	---	---	---	---	+2548	---	+231		+889	-3108

**Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.**

SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.—Continued

1951	Little Rock, Ark.	Los Angeles, Calif. · (WBAS)	Los Angeles, Calif. (WBO)	Lynn, Mass.	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R.I.	New York, N.Y.	North Head, Wash.	*Oak Ridge, Tenn.	Ottawa, Ontario	Pearl Harbor, T.H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Riverside, Calif.	St. Cloud, Minn.
October 29---	84	422	349	309	281	283	458	105	360		---	217	---	158	377	340	391	
October 30---	160	287	220	66	114	314	490	376	140		---	274	---	214	111	359	228	
October 31---	45	295	205	124	240	303	456	41	264		149	70	---	384	269	205	259	
November 1---	119	286	197	---	295	290	492	37	18		264	124	---	515	413	312	268	
November 2---	139	391	348	57	256	(195)	478	36	98		142	34	---	535	462	88	401	
November 3---	411	410	304	5	66	100	380	384	38		119	402	---	375	440	160	417	
November 4---	363	386	304	---	324	(257)	89	312	272		---	363	---	507	432	181	400	
Averages------	189	354	275	112	225	(249)	406	184	170		168	212	---	384	358	235	338	
Departures----	---	---	---	-60	+41	+38	---	-26	-40		+29	-25	---	-40	-46	+37	+23	
November 5---	53	342	310	164	282	290	235	248	200		263	315	282	437	420	317	390	
November 6---	135	364	319	239	121	265	404	26	279		84	35	263	365	428	41	392	
November 7---	389	325	266	T	281	173	463	43	15		69	34	42	527	414	24	361	
November 8---	399	326	281	189	244	---	501	309	202		---	392	58	315	405	86	371	
November 9---	341	345	301	311	255	---	316	297	315		38	353	200	289	335	225	364	
November 10---	109	175	150	135	246	76	(428)	304	254		36	327	225	440	224	286	187	
November 11---	138	315	234	181	218	50	277	299	273		94	347	163	414	398	295	317	
Averages------	223	313	266	174	235	171	(375)	218	220		98	258	176	398	375	182	340	
Departures----	---	---	---	+20	+73	-14	---	+8	+21		-21	+20	+33	+19	+1	+14	+38	
November 12---	68	264	137	233	84	145	467	57	288		---	(77)	264	427	174	74	106	
November 13---	220	353	221	117	17	71	450	118	154		30	204	88	479	324	37	346	
November 14---	279	352	319	61	80	141	(399)	300	124		---	157	39	495	314	282	307	
November 15---	168	326	287	130	108	159	385	293	182		---	(255)	204	462	348	263	340	
November 16---	363	336	303	3	115	279	430	47	26		---	216	37	477	381	121	361	
November 17---	242	365	335	4	136	236	221	85	106		140	89	128	483	233	109	367	
November 18---	351	349	318	202	250	125	437	214	261		71	136	139	440	364	117	351	
Averages------	241	335	274	107	113	165	(398)	159	163		---	(162)	128	466	305	143	311	
Departures----	---	---	---	-33	-38	+16	---	-52	-18		---	-57	+5	+62	-41	-8	+35	
November 19---	352	150	140	204	188	138	439	296	256		68	309	159	245	362	249	229	
November 20---	353	199	140	294	200	141	411	297	163		104	340	200	400	348	263	218	
November 21---	185	235	181	203	179	---	385	260	280		---	367	243	398	220	251	206	
November 22---	159	189	171	113	21	54	356	133	200		169	274	31	465	298	56	166	
November 23---	92	334	273	77	116	---	315	38	195		188	201	82	504	56	30	219	
November 24---	43	344	231	T	237	---	370	28	22		31	28	125	469	257	220	356	
November 25---	78	346	310	201	40	---	447	31	260		39	34	215	527	350	61	345	
Averages------	180	257	207	156	140	---	389	155	197		100	222	151	428	270	161	248	
Departures----	---	---	---	+30	+10	---	---	-25	+42		+13	+24	+30	+28	-56	+40	-25	
November 26---	253	316	260	137	130	118	418	67	97		---	237	92	398	354	97	285	
November 27---	240	335	278	183	211	117	342	45	264		45	58	236	433	350	80	327	
November 28---	269	273	263	101	148	130	230	228	166		44	106	75	438	349	154	325	
November 29---	301	286	244	84	118	97	219	226	152		51	332	120	313	348	207	319	
November 30---	301	177	203	128	121	60	317	237	213		14	348	155	391	333	212	304	
December 1---	279	97	35	162	91	73	288	253	206		109	322	42	269	325	217	179	
December 2---	57	239	203	123	95	119	341	215	195		80	259	175	494	268	132	184	
Averages------	243	246	212	131	131	102	308	181	185		57	237	128	391	332	157	275	
Departures----	---	---	---	+11	+3	-15	---	+17	+32		-11	+42	---	+32	+19	+36	+21	
Accumulated Departures January 1 to December 2, 1951	---	---	---	---	-4305	+2576	---	+7252	+2513		---	+3980	+1848	+7147	---	---	+8666	

1951	Salt Lake City, Utah	San Antonio, Tex.	Santa Maria, Calif.	Sault Ste. Marie, Mich.	Sayville, N.Y.	Schenectady, N.Y.	Seabrook, N.J.	Seattle, Wash. (U. of W.)	Spokane, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W.I.	Thule, Greenland	Toronto, Ontario	Upton, N.Y.	Wake Island, Pacific Area	**Washington, D.C. (WBCO)	Winnipeg, Manitoba
October 29---	291	184	437	57	369	259	359	59	309	329	249	564		188	388		365	105
October 30---	294	345	299	62	115	125	173	253	297	76	146	543		137	147		104	199
October 31---	313	298	338	111	141	139	205	239	285	80	323	546		197	198		230	141
November 1---	335	368	392	168	9	49	47	252	271	64	86	585		148	34		54	186
November 2---	317	383	399	276	9	85	36	146	224	19	350	545		82	47		16	222
November 3---	284	492	400	256	9	27	45	55	44	84	151	553		166	47		188	252
November 4---	179	482	405	231	227	256	329	155	138	286	308	555		265	270		288	220
Averages------	287	365	382	166	126	134	170	166	224	134	230	556		169	161		178	189
Departures----	+30	---	+9	---	-75	---	-55	+43	+38	-40	-38	---		+26	-41		-59	+38
November 5---	321	344	374	212	201	224	270	145	166	209	121	(460)		287	237		302	248
November 6---	316	438	358	230	273	209	267	24	125	202	314	472		98	307		231	162
November 7---	274	490	398	40	45	22	118	90	180	85	153	526		24	(248)		109	160
November 8---	248	446	325	167	193	112	108	106	168	108	277	164		128	205		186	206
November 9---	275	379	343	126	308	215	299	83	107	282	300	160		204	340		313	181
November 10---	244	321	353	167	229	216	288	80	118	238	77	(195)		206	(276)		288	140
November 11---	124	284	281	94	250	267	273	27	167	217	64	202		232	288		299	146
Averages------	257	386	347	148	214	181	232	79	147	192	186	(311)		168	(272)		247	178
Departures----	+52	---	+10	---	+13	---	+12	-26	-15	+31	-68	---		+53	+73		+14	+50
November 12---	66	294	113	89	278	254	289	83	105	194	25	535		160	---		256	18
November 13---	206	404	375	14	(181)	144	114	32	164	118	131	514		22	---		75	33
November 14---	57	420	370	22	74	66	111	90	182	29	292	420		134	---		69	70
November 15---	252	381	373	54	185	141	230	50	262	165	296	530		189	194		218	125
November 16---	305	261	371	154	37	27	167	160	165	54	313	527		27	---		130	103
November 17---	273	414	(330)	107	279	62	170	170	213	96	195	123		117	241		205	162
November 18---	271	292	365	150	303	224	230	73	149	176	343	109		155	254		262	177
Averages------	205	352	(328)	84	(191)	131	187	94	177	119	228	394		115	---		174	98
Departures----	+26	---	+21	---	+5	---	-18	+6	+44	-45	-16	---		+7	---		-39	-15
November 19---	146	349	(116)	202	187	219	211	50	131	135	319	372		227	(165)		291	129
November 20---	146	170	165	157	218	138	284	23	73	278	298	242		232	(198)		308	109
November 21---	76	149	287	150	299	236	292	78	77	272	271	(263)		142	273		306	113
November 22---	199	253	229	24	218	29	207	72	153	51	125	41		34	194		159	198
November 23---	182	324	371	144	183	56	172	94	50	28	40	(393)		76	144		161	211
November 24---	37	301	348	118	21	89	37	36	54	53	40	(443)		135	29		50	150
November 25---	243	144	353	110	264	223	203	15	60	148	206	475		195	248		168	89
Averages------	147	241	(267)	129	199	141	201	52	85	138	186	(318)		149	(179)		206	143
Departures----	-6	---	-27	---	+40	---	+12	-20	-31	+13	-52	---		+54	+30		+3	+32
November 26---	232	97	173	118	120	39	93	80	76	93	84	490		87	123		234	---
November 27---	186	407	316	199	283	234	220	14	85	255	301	482		205	255		209	---
November 28---	121	197	330	24	152	113	192	58	181	91	277	517		31	(156)		216	---
November 29---	222	267	340	29	248	148	214	93	57	139	261	409		55	(207)		280	---
November 30---	105	126	309	100	244	184	224	13	104	202	275	490		118	228		273	---
December 1---	153	208	44	31	202	139	198	110	107	185	73	306		82	(198)		305	---
December 2---	124	273	302	17	188	155	220	112	172	184	277	219		67	175		(308)	---
Averages------	163	225	259	74	206	145	195	68	112	164	219	416		92	(192)		261	---
Departures----	+6	---	-12	---	+54	---	+15	+4	-1	+30	-12	---		-2	+45		+64	---
Accumulated Departures January 1 to December 2, 1951	+441	---	-1638	---	+1512	---	+2135	---	-1281	+2331	---	---		-231	+5712		---	+714

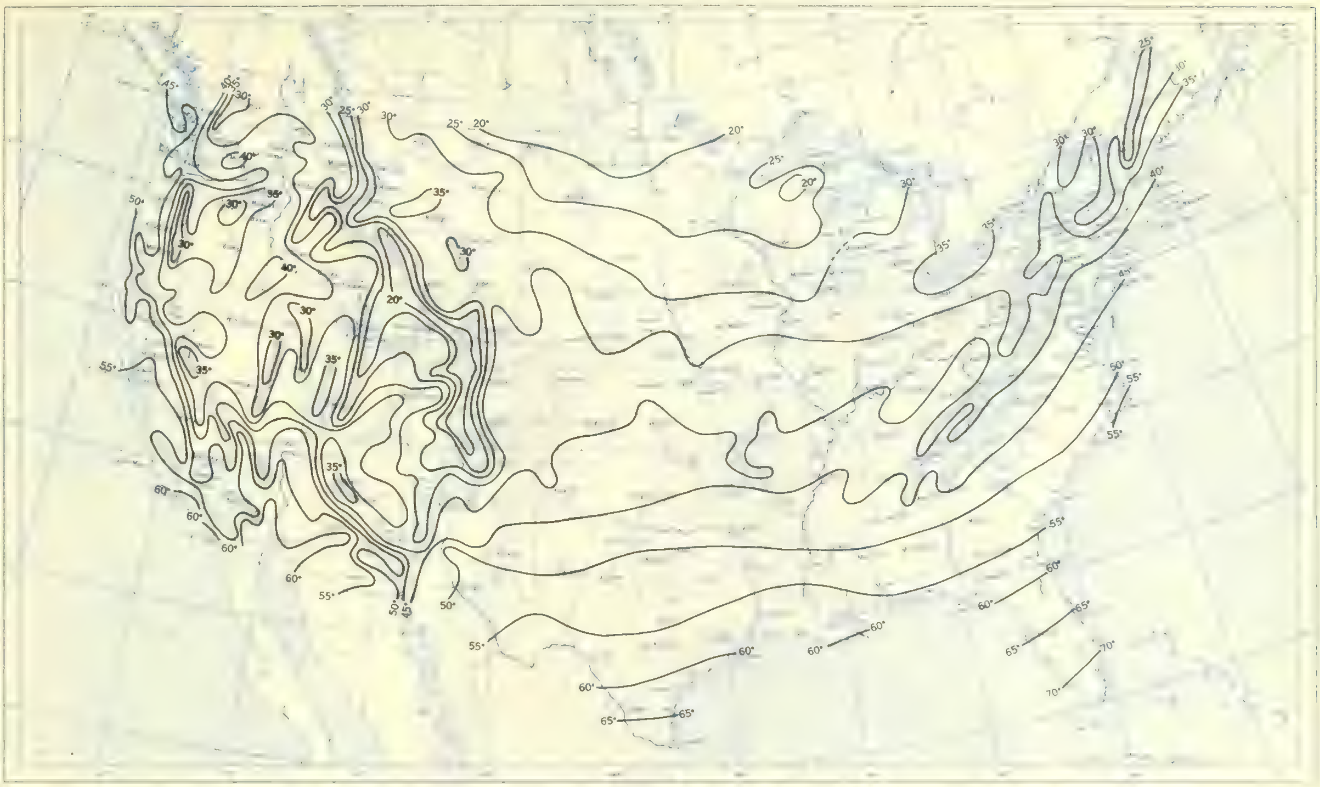
Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

* Correction: In the February 1949 issue of Monthly Weather Review, the description of station location and instrumental equipment at Oak Ridge, Tenn., included a Brown Electronik recording potentiometer. Actually, a Leeds & Northrup Micromax recorder has always been in use at that station.

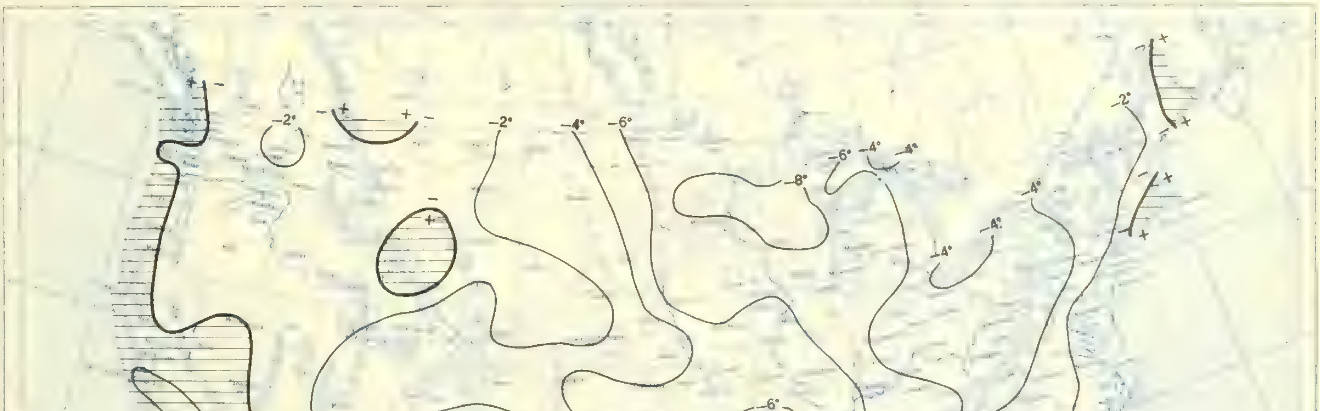
** Data for Washington, D.C. were recorded at American University prior to Oct. 29, 1950, and since that time at the Weather Bureau Central Office ("W.B.C.O.") except for the period April 11-29, 1951 which were recorded at American University. The pyreheliometer at the W.B.C.O. is mounted on the roof of the Administration Building, and data are recorded by a Brown Electronic Recording Potentiometer. The exposure is similar to that at American University as regards general atmospheric pollution. After repairs to instrumentation at American University are completed, it is planned to publish data from both stations for comparison purposes.

W.B.T.U., New Orleans, Louisiana --- 3/17/52 --- 2000

Chart I. A. Average Temperature (°F.) at Surface, November 1951.



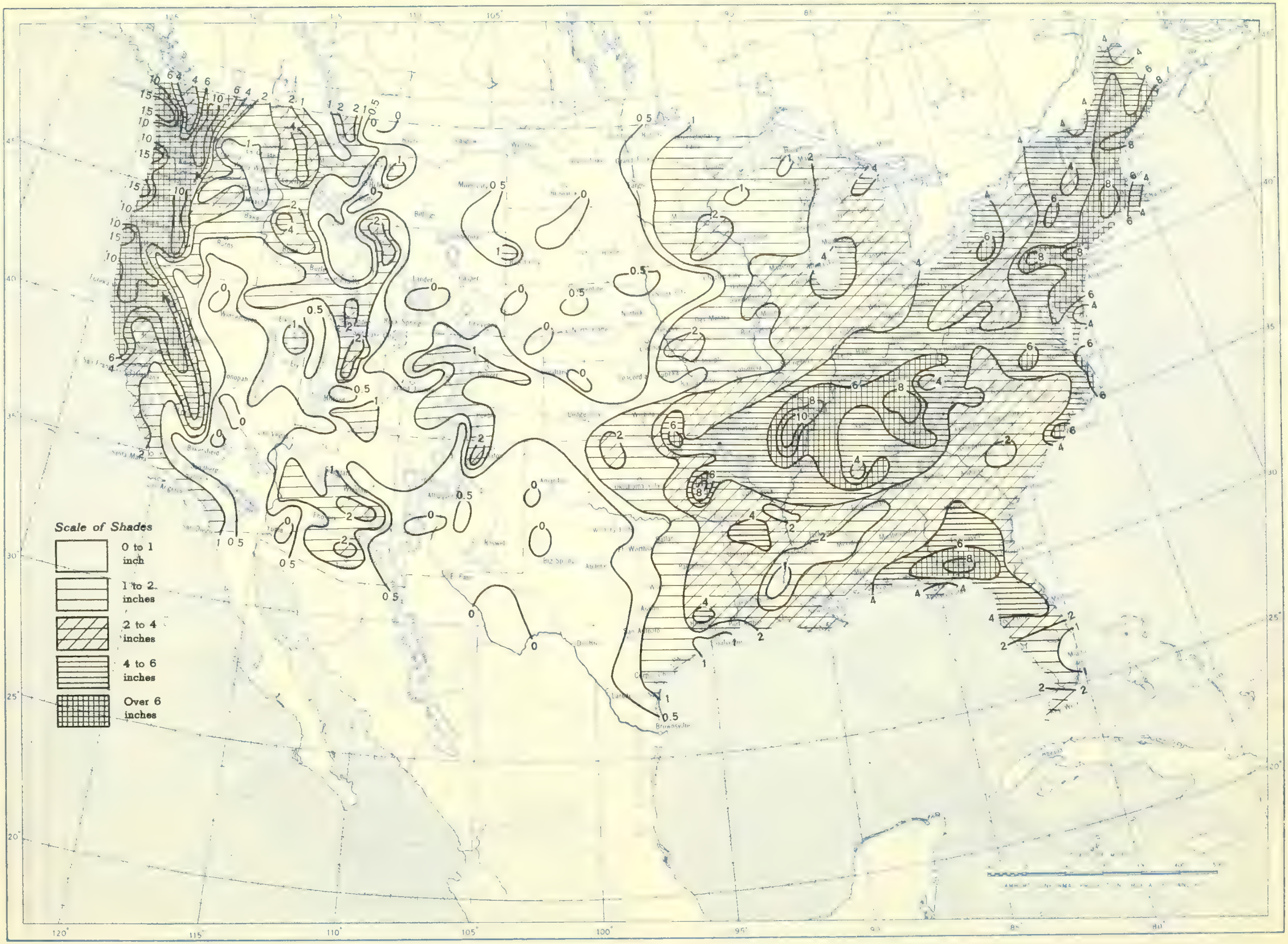
B. Departure of Average Temperature from Normal (°F.), November 1951.



A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.

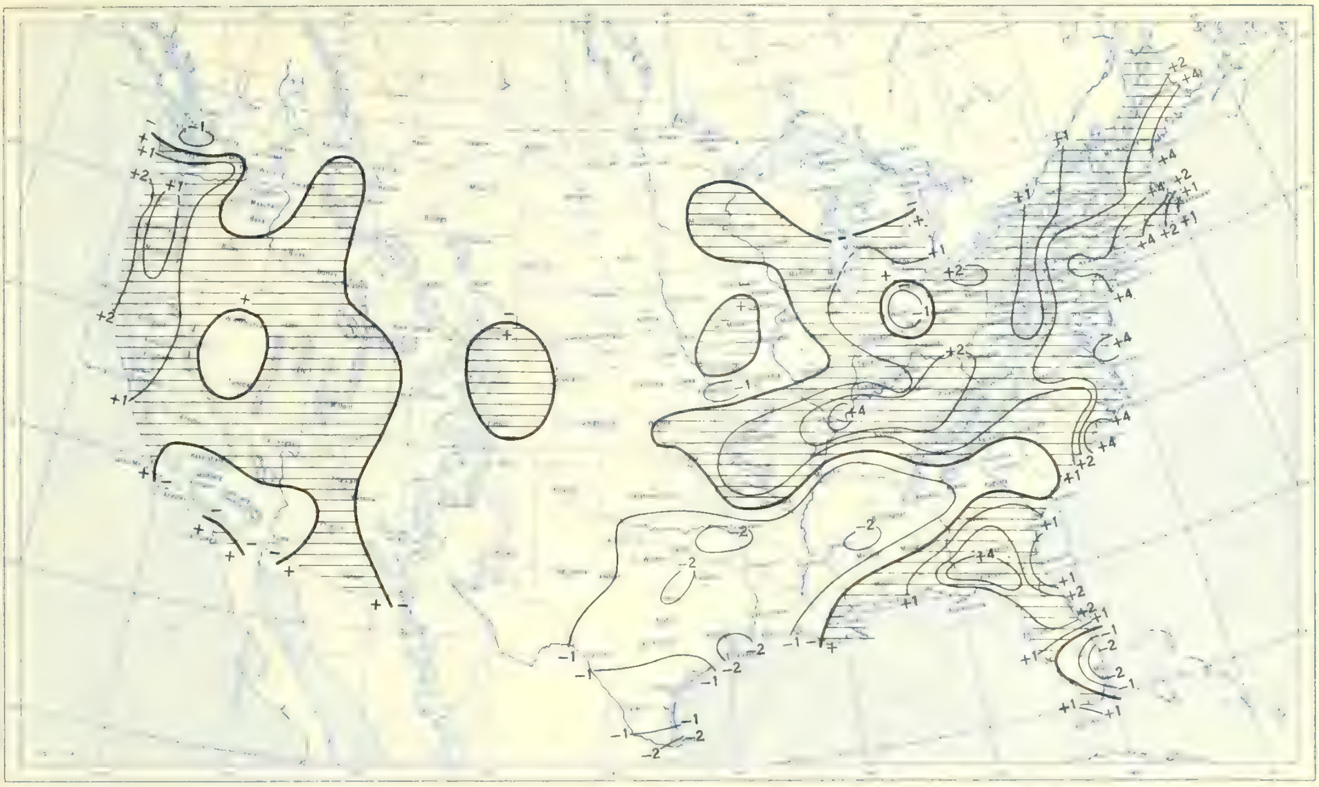
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), November 1951.

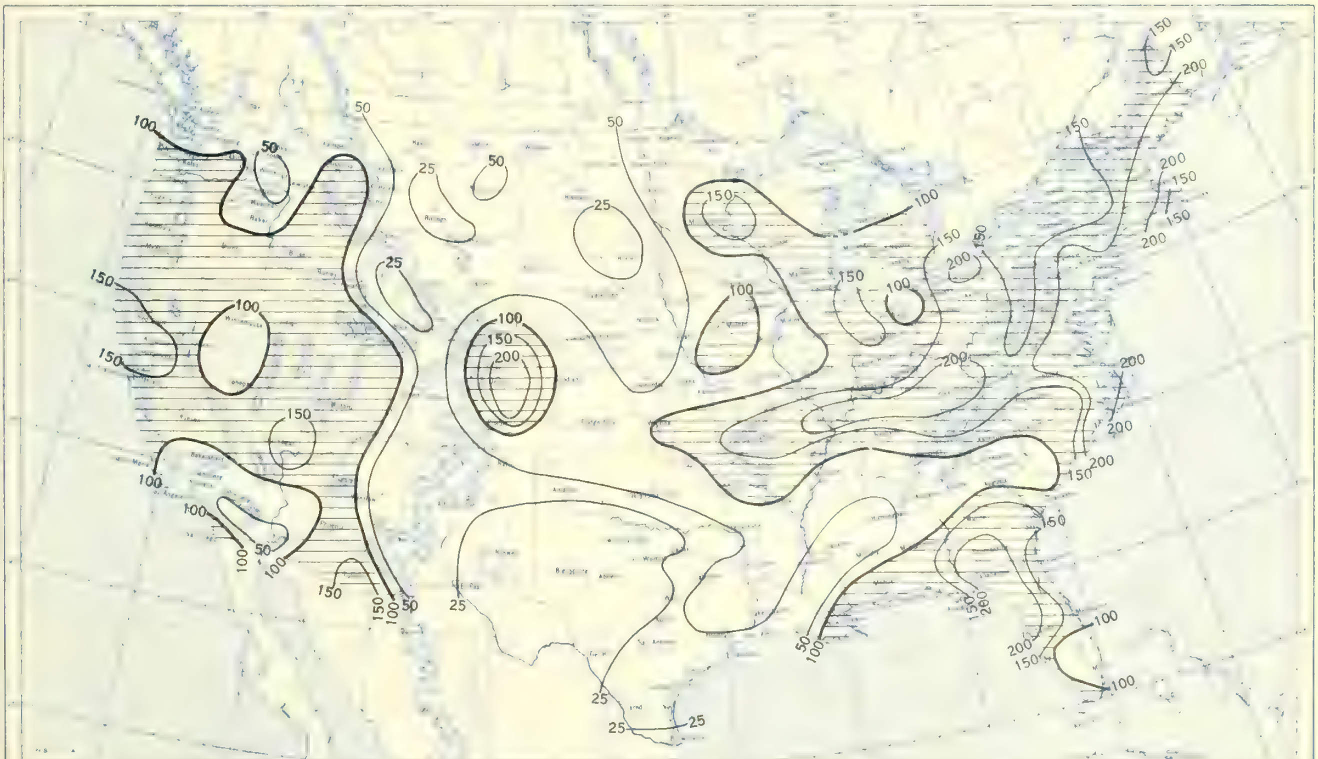


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), November 1951.

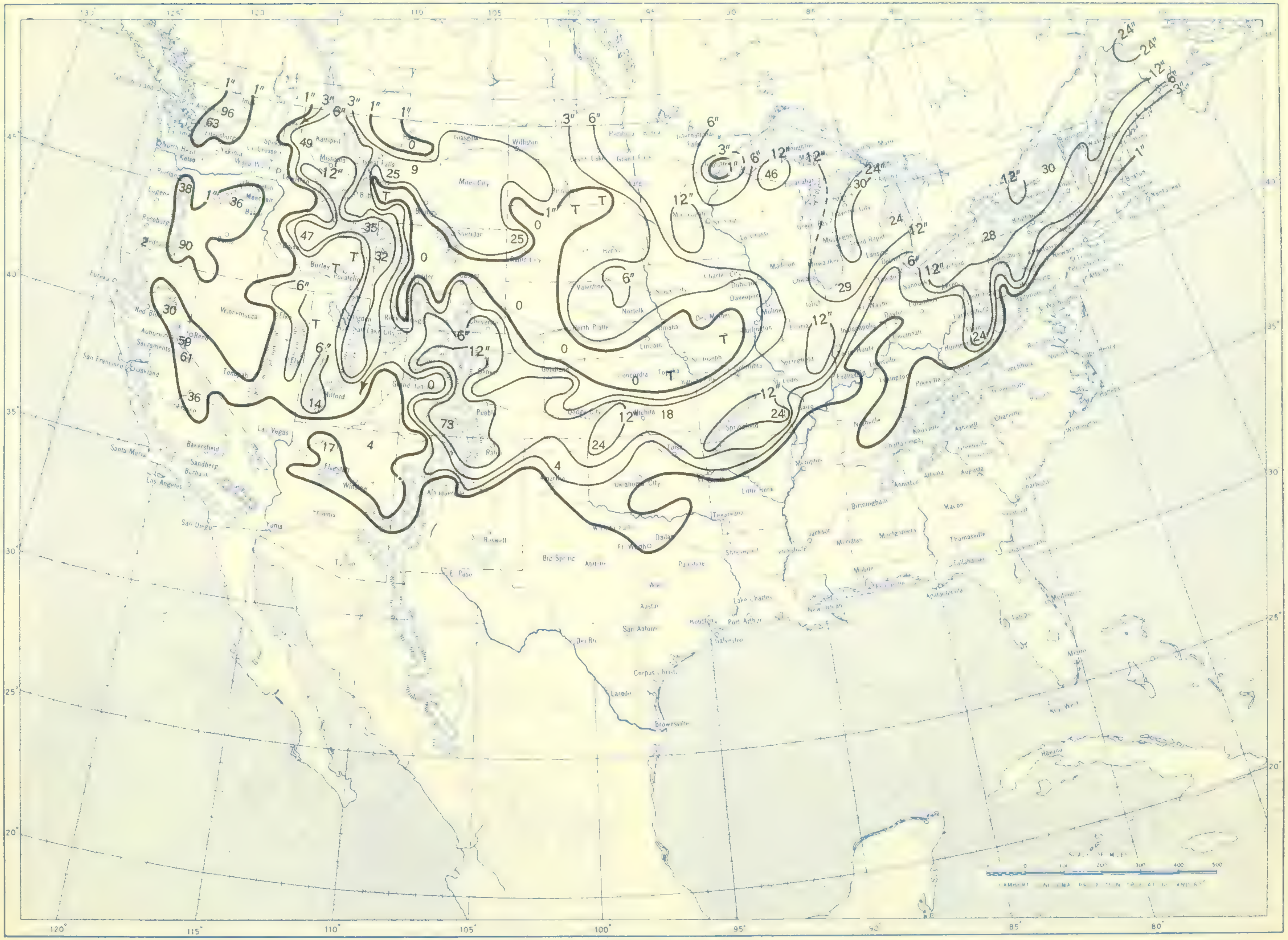


B. Percentage of Normal Precipitation, November 1951.



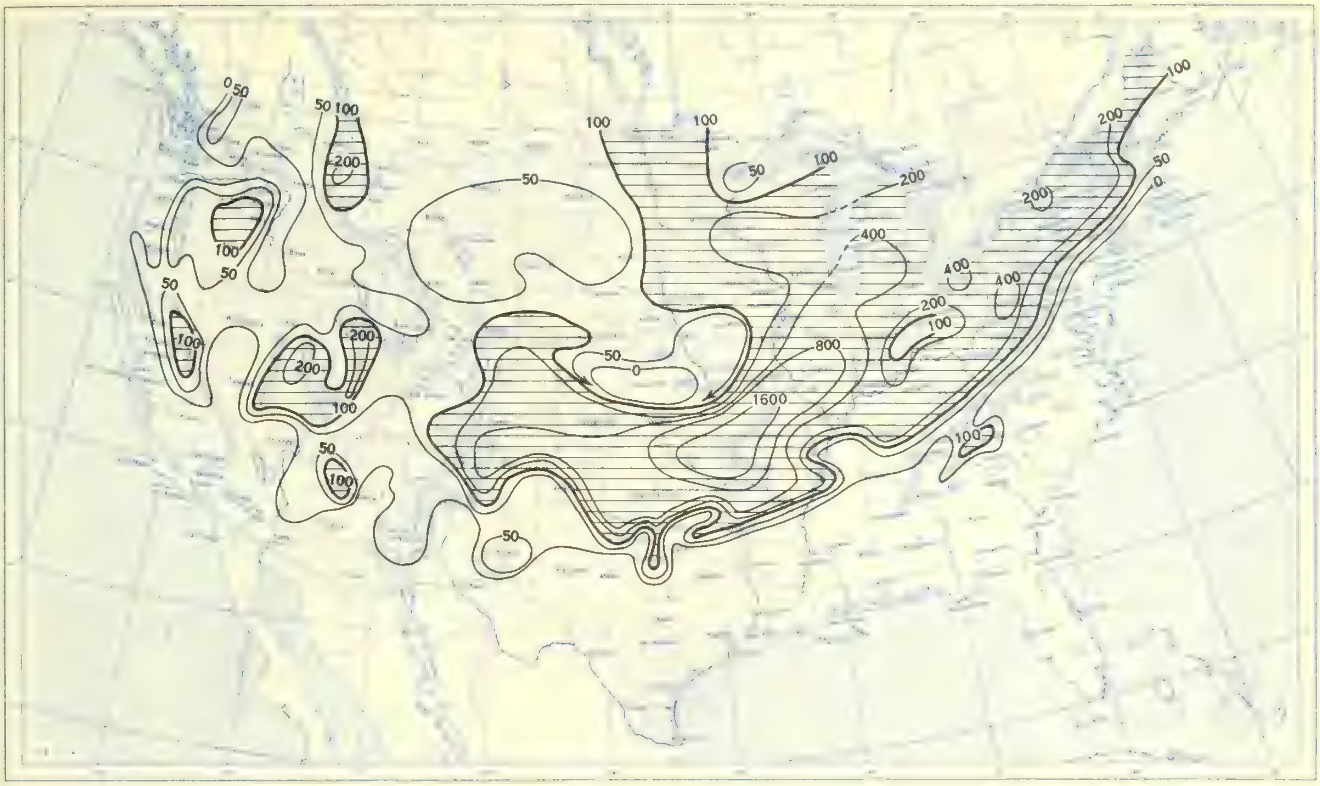
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), November 1951.

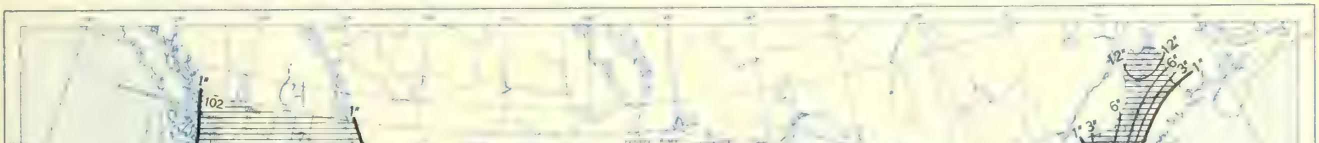


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, November 1951.

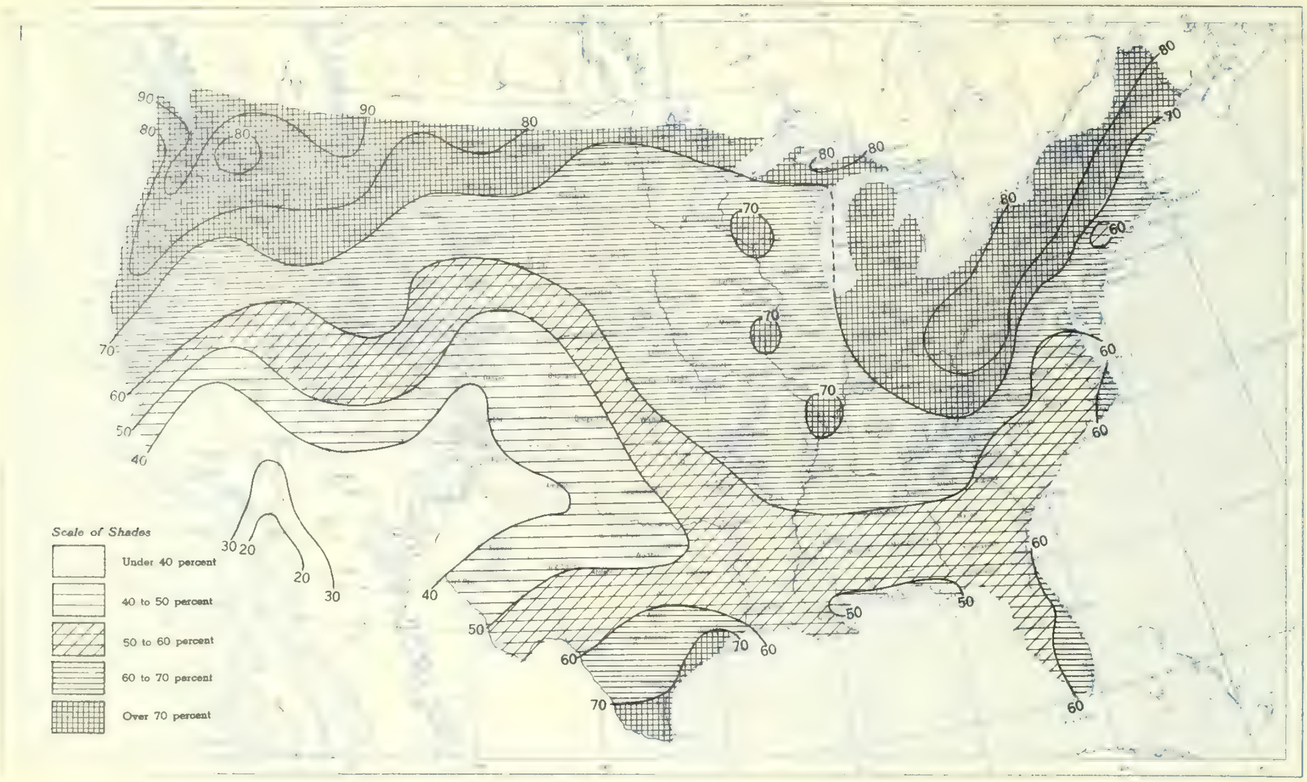


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., December 4, 1951.

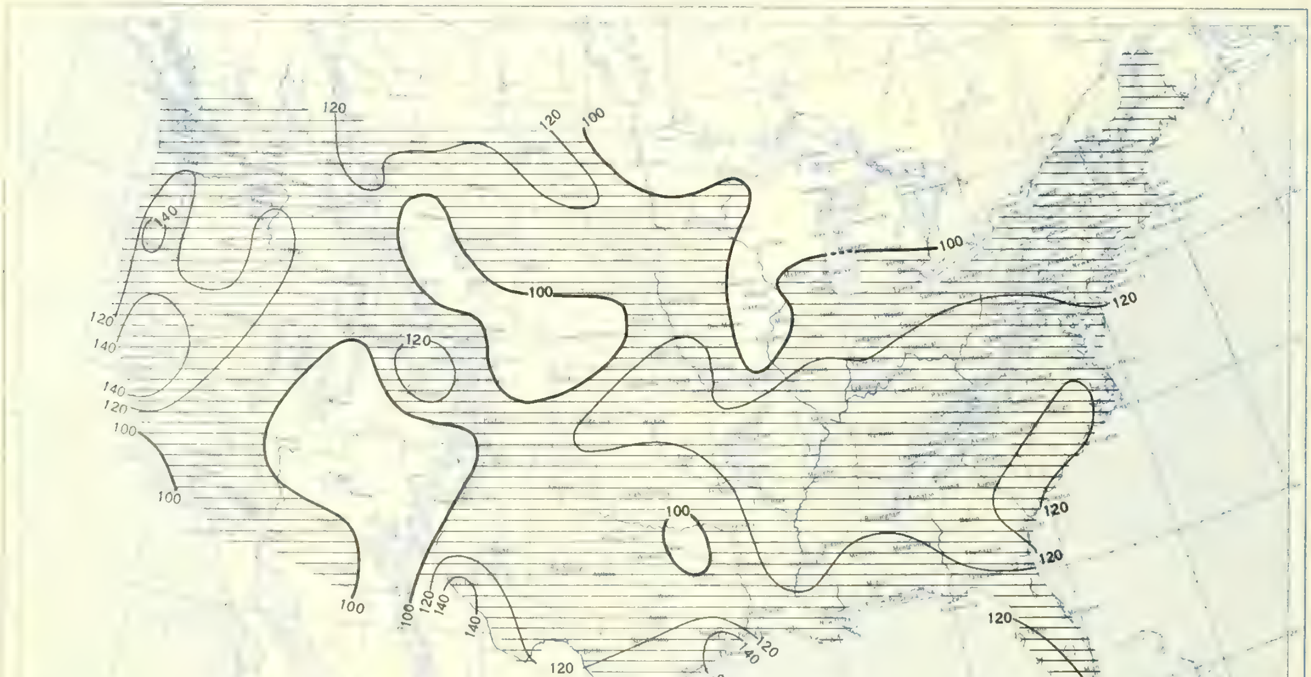


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a. m. E.S.T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, November 1951.

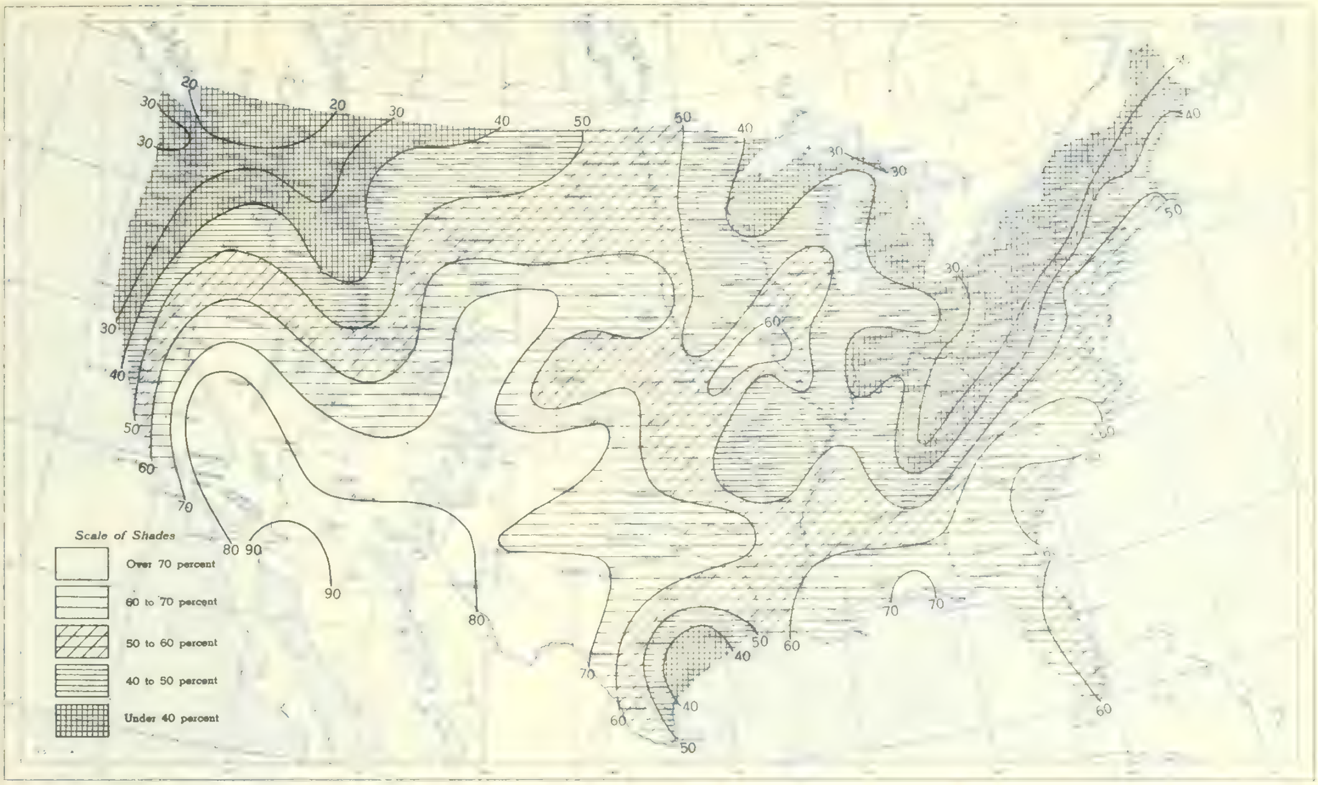


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, November 1951.

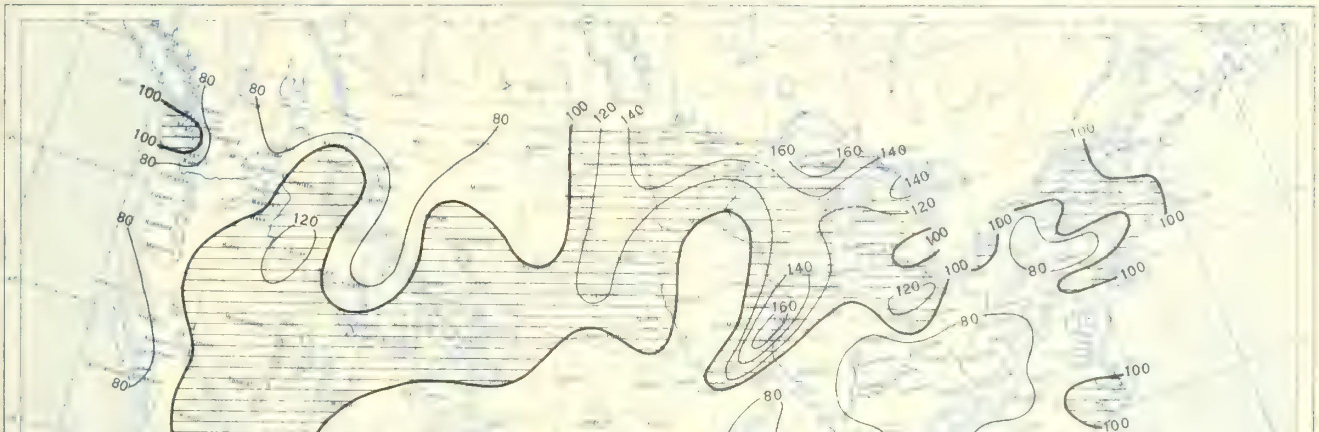


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, November 1951.

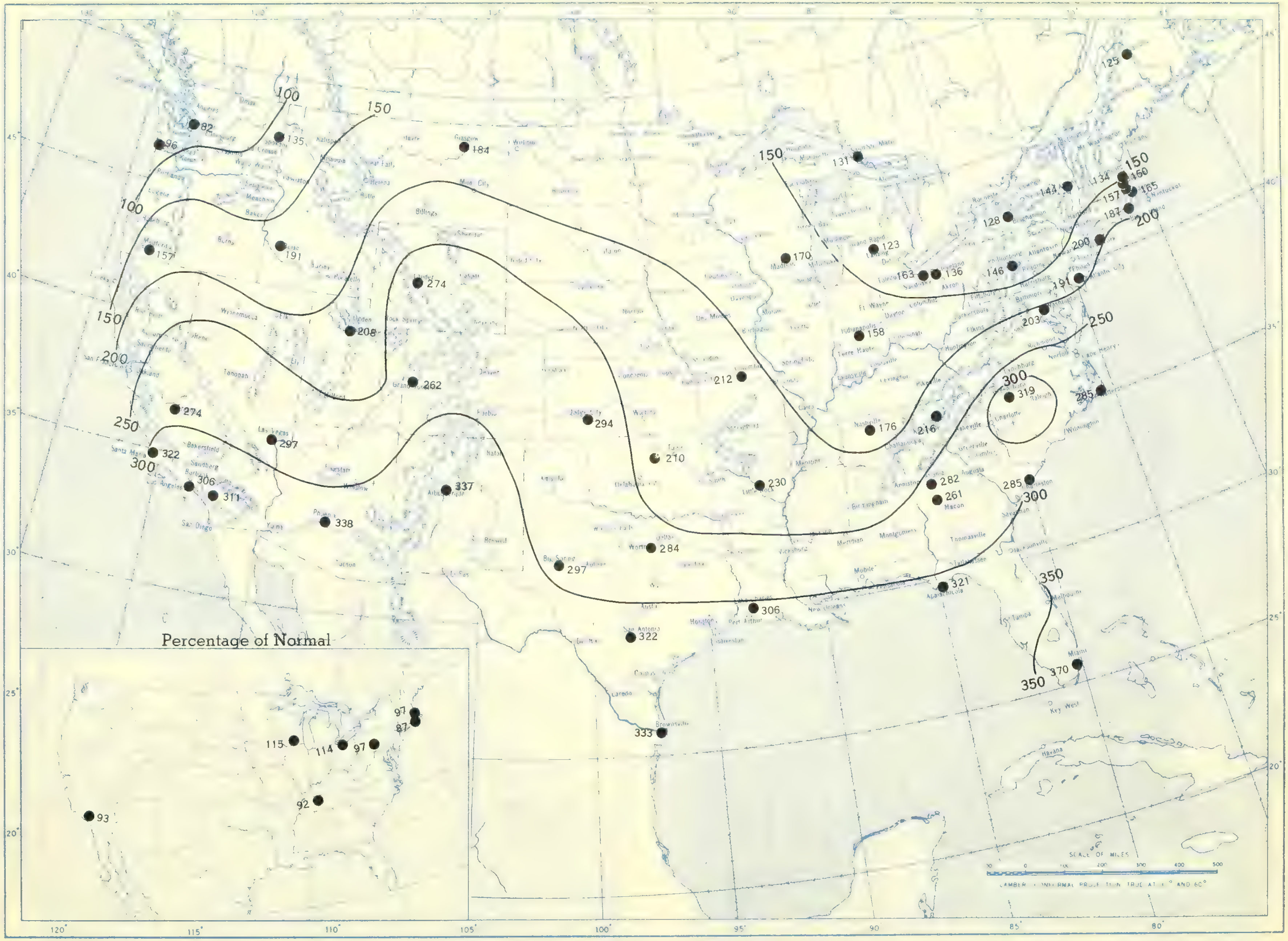


B. Percentage of Normal Sunshine, November 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

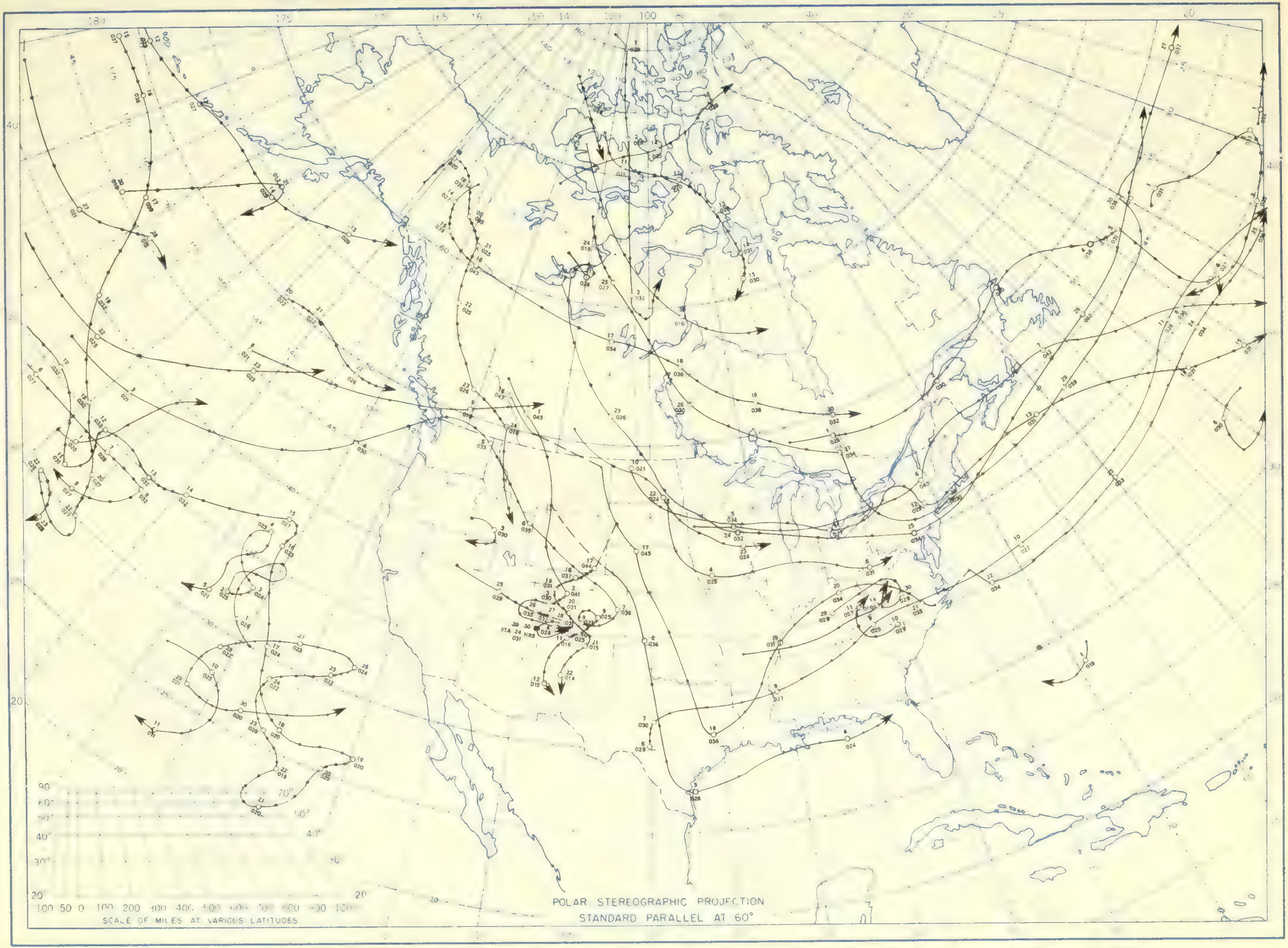
Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, November 1951. Inset: Percentage of Normal Average Daily Solar Radiation, November 1951.



Percentage of Normal

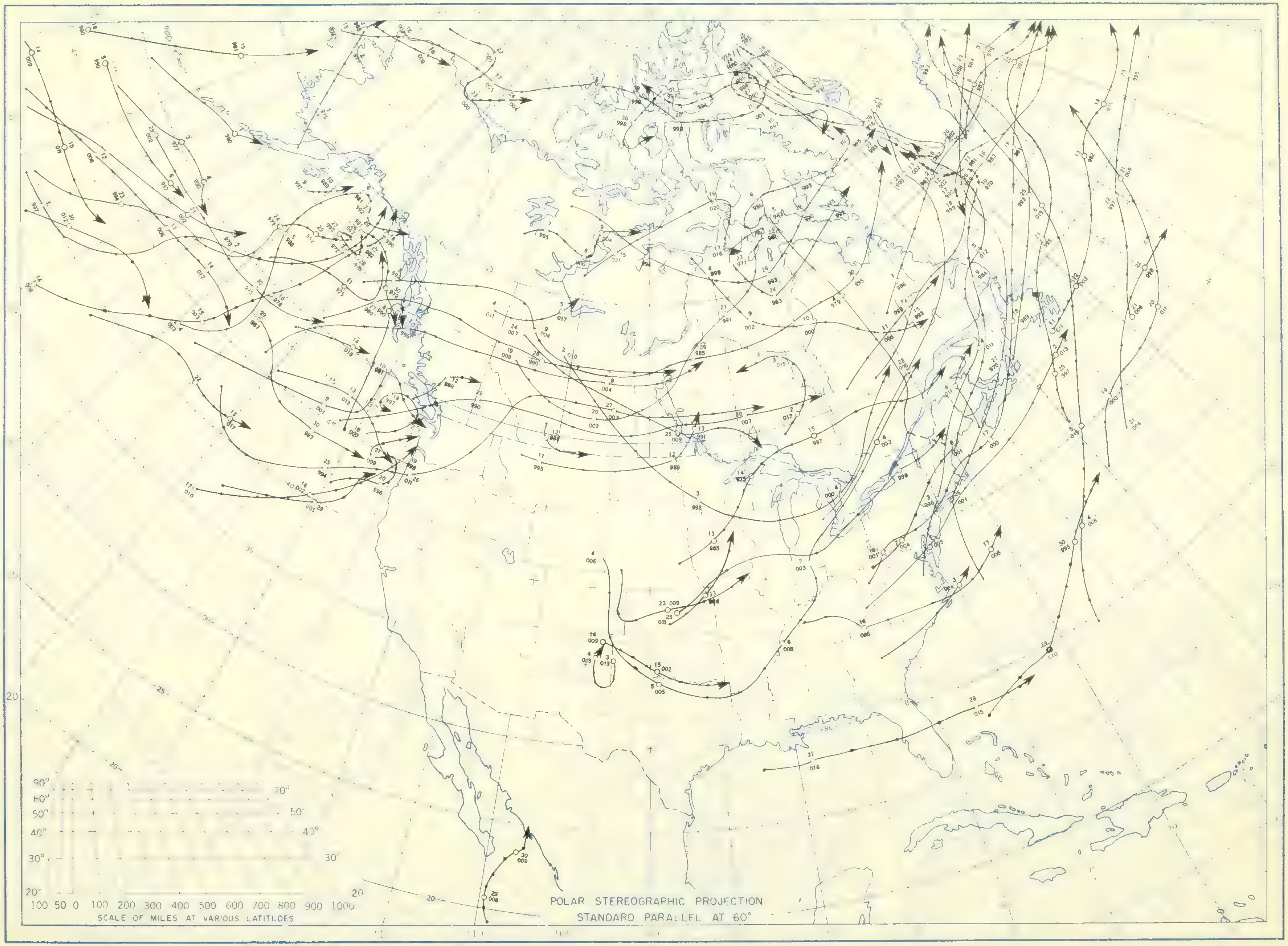
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are

Chart IX. Tracks of Centers of Anticyclones at Sea Level, November 1951.



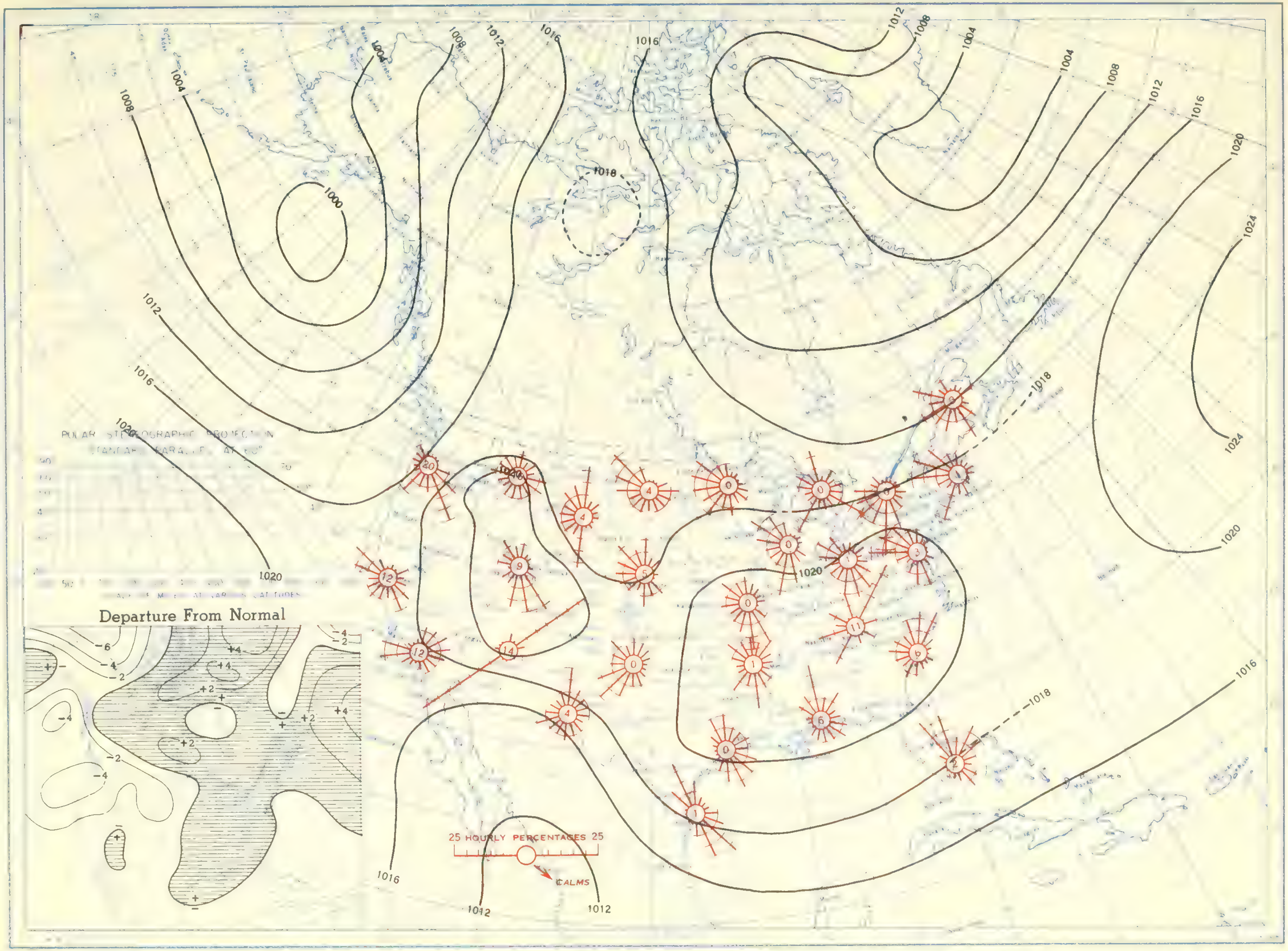
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, November 1951.



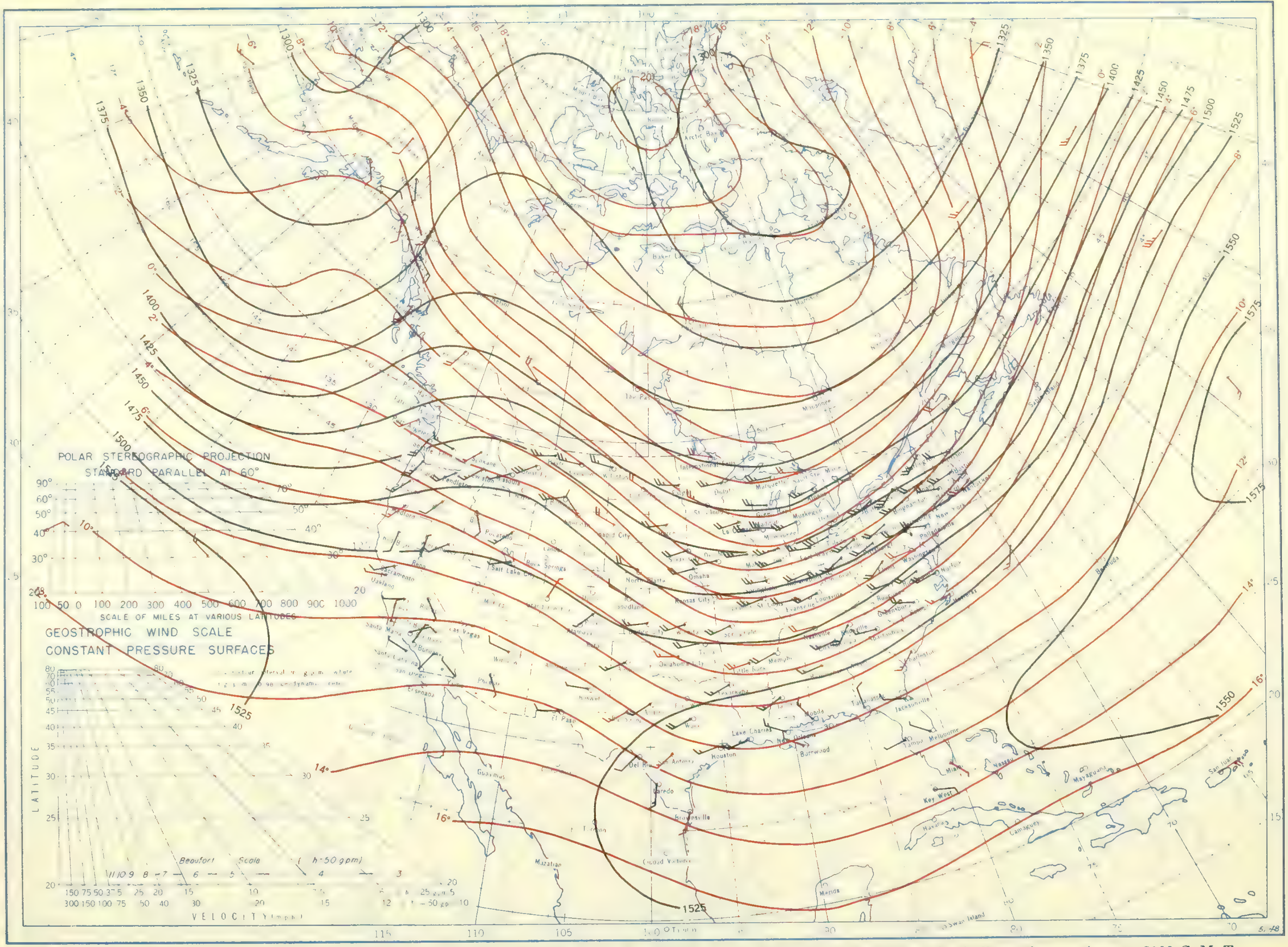
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Average Pressure (mb.) from Normal, November 1951.



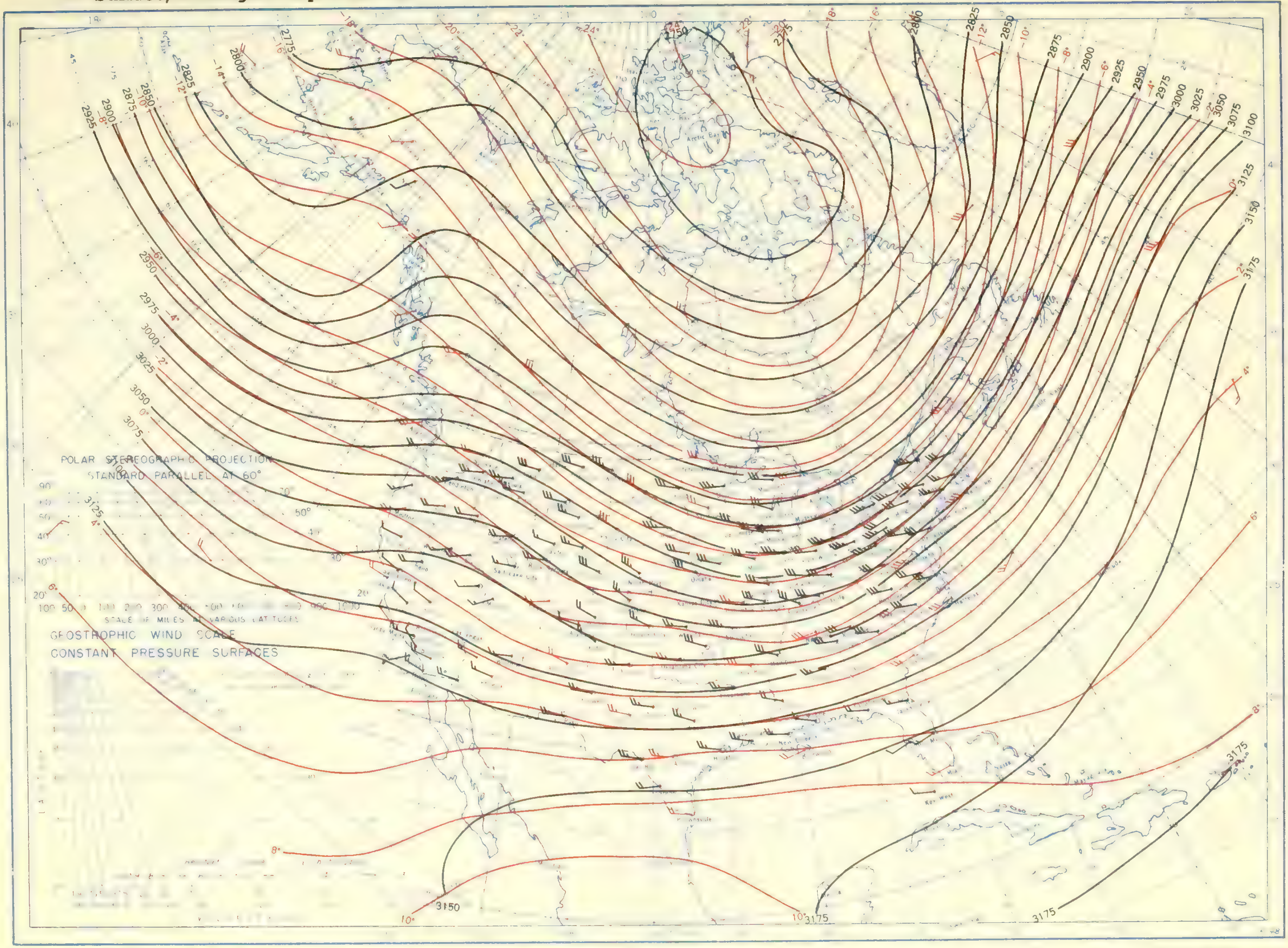
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), November 1951.



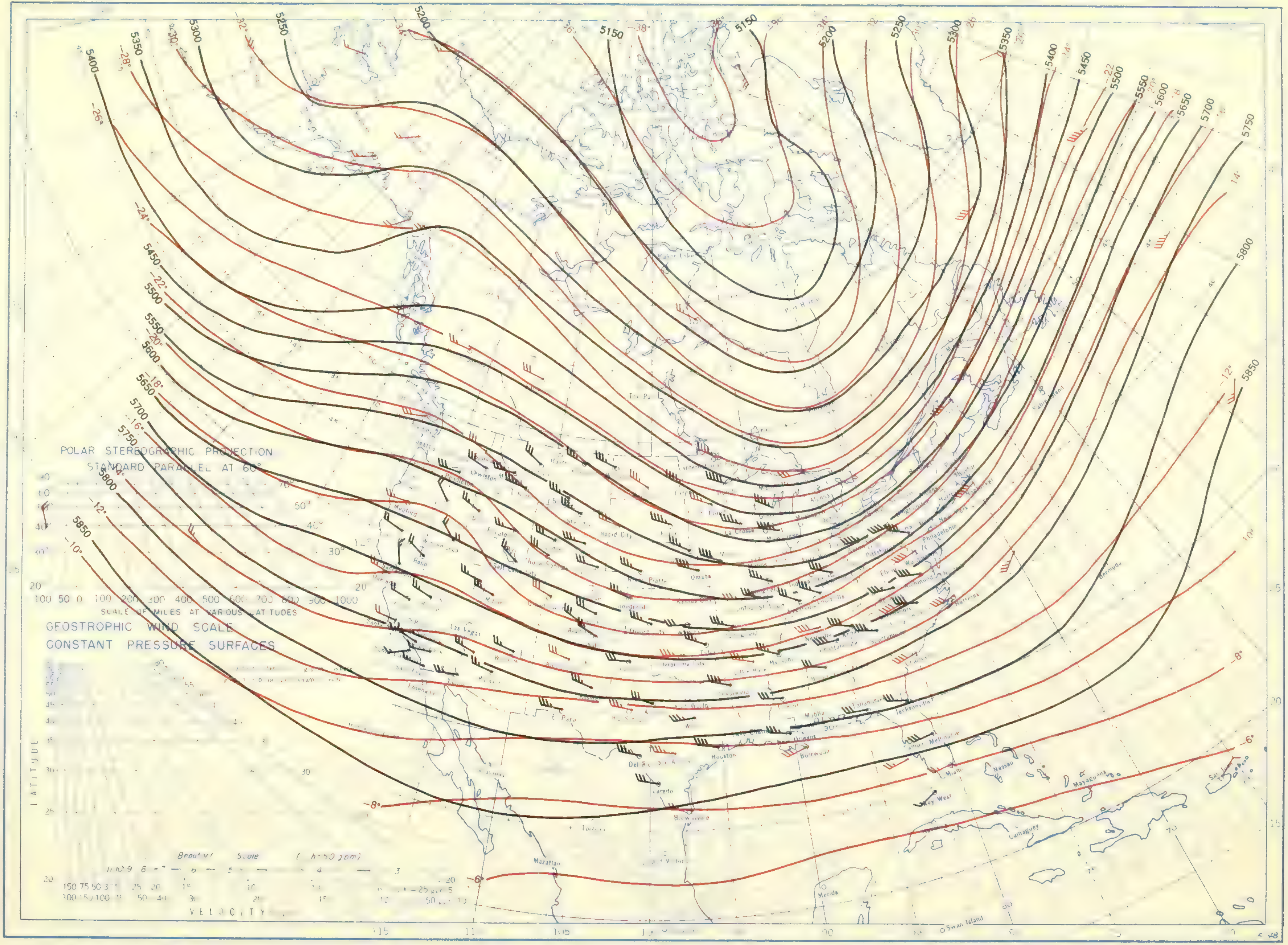
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), November 1951.



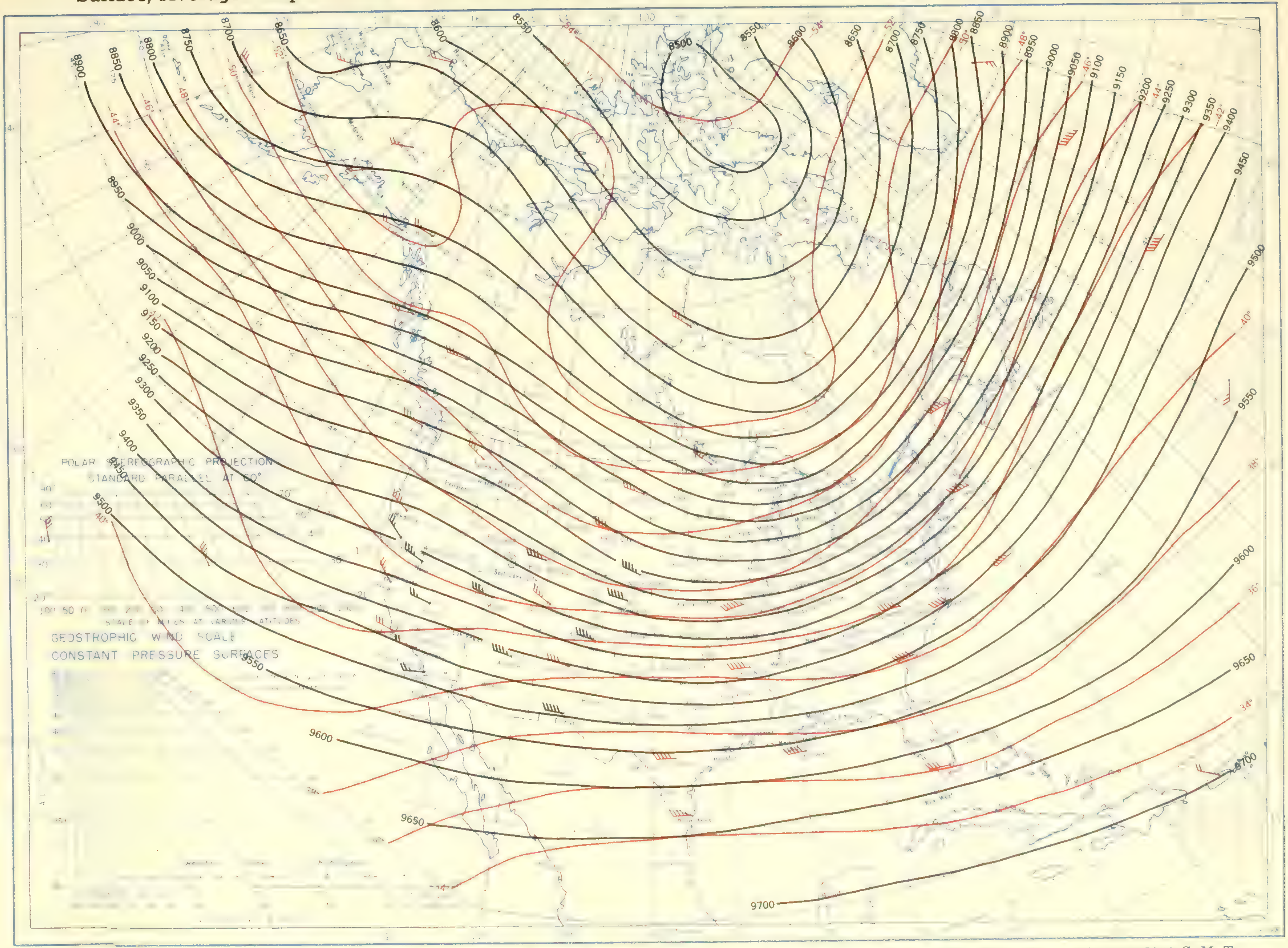
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), November 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), November 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

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WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

DECEMBER 1951
Volume 2 No. 12

CHATTANOOGA: 1952

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions---------- 353

Condensed Climatological Data - States---------- 355

Climatological Data - Stations---------- 356

Heating Degree Days---------- 361

Severe Storms---------- 362

General Summary of River and Flood Conditions---------- 368

Flood Stage Data---------- 370

UPPER AIR DATA

Radiosonde Data---------- 371

Pilot Balloon Data---------- 374

Rawin Data---------- 375

SOLAR RADIATION DATA

Solar Radiation Intensities---------- 376

Blue Hill Data---------- 377

Daily Totals and Average Daily Totals by Weeks---------- 378

CHARTS I-XV

NOTE.--This publication contains all of the climatic data formerly printed in the MONTHLY WEATHER REVIEW.

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 12

DECEMBER 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

For the country as a whole, December 1951 was wetter and much colder than usual. Snowfall was extremely heavy in northern and western areas and set numerous new local records. The average monthly pressure was below normal, except along the Atlantic Coast. During the month several deep Lows caused rapid pressure changes and a number of stations reported new record low pressure readings. Monthly temperature ranges were high, particularly east of the Rocky Mountains, and there were several record extremes. East of the Rocky Mountains the weather was severely cold during the second decade and the first half of the third, but unseasonably mild during the first week and the last 3 days of the month. Droughty conditions continued in the western portions of the lower Great Plains. There were frequent high winds, and the number of tornadoes was greater than usual for December.

The average temperature for the United States was 32.8°, which was 1.5° below the long-term mean and the lowest since 1945. Monthly average temperatures were above normal south and east of a line extending from Yuma, Ariz. to extreme northeastern Ohio and below normal to the west and north. Extreme departures ranged up to 4° above normal in portions of the Atlantic and Gulf coastal areas, and were as much as 10° below normal in north-central Montana. Average temperatures for the month ranged from about 75° in extreme southern Florida to near zero at a few stations in the northern Rocky Mountains and along the North-Central Border. Extreme temperatures for the month ranged from 98° at Catulla, Tex., on the 6th to -41° at Taylor Park, Colo., on the 7th and Bondurant, Wyo., on the 9th. East of the Rocky Mountains the highest temperatures occurred from the 1st to the 10th or on the 30th and 31st, and the lowest temperatures generally from the 15th to the 21st. In the far West extremes occurred on various dates. Among the many stations recording their highest December temperatures on record were Oklahoma City, Okla.; Columbus, Ohio; Fort Smith and Little Rock, Ark., Asheville, N. C.; Vicksburg, Miss.; Abilene and Dallas, Tex.; and Memphis and Knoxville, Tenn. Ninety-two degrees at Ardmore, Okla., on the 30th and 80° at Picardy, Md., on the 7th were the highest December temperatures ever recorded in those States. Extremes of -14° on the 16th and 68° on the 31st established new December records for Columbus, Ohio.

Precipitation totals in the United States averaged 2.26 inches, which is 0.66 inch above the long-term mean. The most important deficiencies were recorded in the lower Great Plains, where monthly totals have been below normal in some sections for several months. Less important deficiencies occurred in western Washington and the Columbia River Valley, the extreme southwestern desert areas, central Wyoming, northern North Dakota, eastern North Carolina, central Gulf areas, and the Florida Peninsula. Sixty-two stations in Texas, 4 in New Mexico, and 3 in Oklahoma received no precipitation, while many others in these states received only a trace. In addition, several stations in southeastern Colorado and southwestern Kansas received only a trace. In western portions of Oregon and California, along the western slopes of the Rockies, and in the lower Ohio Valley and Tennessee monthly totals exceeded 200 percent of normal. Precipitation in these areas was well distributed through the month, and there was no serious flooding. The greatest monthly total was 25.57 inches at Inskrip, Calif.

Except in southern areas much of the month's precipitation fell as snow, which was generally much above normal in areas where measurable snowfall is common during December. Monthly totals, 24-hour amounts, and depths on the ground set new December records at scattered stations throughout the western and northern sections of the country. Monthly totals exceeded 200 percent of normal throughout the Northwest and ranged up to more than 400 percent along the north Pacific Coast, in northern Idaho, eastern Washington, and in western Montana. In the eastern half of South Dakota and in the lower Lake Region, monthly totals exceeded 300 percent of normal and ranged up to more than 400 percent locally. In the Northeast total snowfall for the month averaged about 200 percent of normal.

In the Northeast the greatest amount of snow fell from the 13th to the 20th, although moderate to heavy amounts also fell in many sections on the 25th. Near the Lakes in western New York snowfall was remarkably heavy. Depths ranged up to about 2 feet in Buffalo and vicinity and 3 feet or more in Watertown and vicinity. On the 17th, 34 inches of snow with a water content of 2.70 inches fell at Watertown, and the monthly total at this station was 73.6 inches. On the 14th light to heavy snowfall badly snarled traffic in several metropolitan areas along the north Atlantic Coast, such as Trenton, N. J.; Philadelphia, Pa.; Baltimore, Md.; and Washington, D. C. This traffic tie-up was described as one of the worst in history in the Philadelphia-Trenton area. Monthly snowfall totals of 19.5 and 35.2 inches were the greatest on record for December at Harrisburg, Pa., and Eastport, Maine, respectively.

In north-central areas monthly totals ranged up to 40.5 inches in Illinois, 26 inches in Minnesota, 61.9 in the Black Hills of South Dakota, 37.5 in Ohio, 27.9 in Iowa, 31.2 in Wisconsin, and 54 inches in Michigan. In southern Michigan accumulations ranged up to 20 inches by the 25th; and some roofs collapsed under the weight of the snow in the cities of Hillsdale, Battle Creek, and Flint, causing several thousand dollars damage. In South Dakota the first severe storm swept the State on the 6th, depositing up to 14 inches of snow in central sections, and frequent snows thereafter increased accumulations in many central sections to over 20 inches; roads remained blocked for long periods and some towns received supplies by airplane. The total snowfall of 54 inches at Grand Rapids, Mich., was a record for any month, and a record depth of 26 inches was measured on the 22d. Record December totals were also measured at Milwaukee, Wis., and Dayton and Toledo, Ohio.

In the far West the average snowfall for Idaho and Montana set new December records, and December record-breaking amounts occurred locally in Utah, Nevada, and Colorado. Monthly totals ranged up to 170 inches in the Sierra Nevada Mountains, 135 inches in the Cascades at Crater Lake, Oreg., which was a December record for that station, 85.5 inches in Wyoming, and 58 inches in Montana. During the closing days of the month up to 33 inches of snow fell in the mountains of western Nevada, 50 inches at Clear Creek, Utah, and all-time record amounts at some points in western Colorado. Monthly totals set new December records at Missoula and Kalispell, Mont., and Spokane, Wash. Spokane also recorded new December records of 12.1 inches in 24 hours and a depth of 25 inches. It snowed on 27 days at Missoula, Mont., a December record for that station. The heavy snowfall in Colorado near the close of the month blocked roads and highways and practically all mountain passes. Avalanches and snow slides marooned trains, trucks, and hundreds of motorists, and two deaths occurred when a truck was swept from the highway near Wolf Creek Pass.

Damaging storms were more numerous than usual for December. Several extra-tropical cyclones gained great intensity. Of four deep Lows that moved over the Pacific Northwest during the month, the one on the 4th-5th did the greatest damage. Precipitation accompanying this storm was not as intense as in many other storms, but wind speeds were unusually high and pressure was extremely low. On the afternoon of the 4th wind speeds ranged from 60 to 100 m.p.h. along the Oregon Coast and as high as 75 m.p.h. at some inland western points, with a fastest mile of 57 m.p.h. at the Portland Airport. All-time low pressures were recorded at Yakima and North Head, Wash., and the lowest of record for December at Tacoma and Spokane, Wash., and Portland, Oreg. The lowest sea-level pressure at North Head, 28.60 inches was 0.12 inch below the previous record in January 1914. This storm caused the death of four persons and widespread damage in Oregon with heaviest damage in coastal sections, and some damage was reported in sections of Washington. Total damage was estimated at more than $500,000 in Oregon and several thousand in Washington. The storm of the 17th and 18th brought heavy snow to some sections of eastern Washington, disrupting communications, halting traffic, and isolating some communities.

Another Low developed great intensity over the central Great Plains on the 5th and 6th. Most stations in the North-Central States registered their highest winds of the month at this time, the fastest mile at some stations exceeding 60 m.p.h. Sea-level pressures of 29.07 and 28.95 inches at Dodge City and Concordia, Kans., on the 6th were new December records. Deep Lows accompanied by high winds and heavy precipitation moved from the Great Plains across the Northeast on the 14th-15th and 18th-19th. The rapid passage of these storms in such a short period caused rapid temperature and pressure changes in the Northeast, where 24-hour temperature changes were as much as 70° in 24 hours and pressure changes were as much as an inch in 12 hours.

Eleven tornadoes occurred during the month, which may be compared to the December average of slightly more than three. Five occurred in Florida, two in Mississippi, and one in each of the States of Illinois, Louisiana, Massachusetts, and Oregon. The one in Louisiana was the most destructive, causing $750,000 damage in New Orleans on the 5th. The one in Illinois caused $217,000 damage; damage from the others was much less. Although the tornadoes in Massachusetts caused some minor damage, this tornado and the one in Oregon were noteworthy as being the first December tornadoes ever reported in those States.

The blizzard in the vicinity of Kalispell, Mont., on the 18th and 19th was extremely severe, wind gusts reached 78 m.p.h., temperatures were zero or below, and 13 inches of loose, dry snow on the ground was blown into the air reducing visibility.

Weather conditions were generally satisfactory for agriculture in the South. Citrus groves were in good condition. Arizona lettuce was of high quality. In Florida oats and rye made good growth, and planting and soil preparation made good progress. The freeze in most southern sections about the middle of the month caused only light, scattered damage. In southern Texas moisture conditions in the flax areas was better than during the past few years, and the early-planted was up to good stands. In the western portions of the lower Great Plains small grains needed more moisture. In other sections of the country the weather was unfavorable for outdoor activities. Grains and livestock generally were in good condition. Grazing was limited in northern areas due to snow, and in some sections supplementary feeding was heavy.

CONDENSED CLIMATOLOGICAL SUMMARY

Table 1 DECEMBER 1951

Section	Temperature								Precipitation					
	Average	Departure from normal	Monthly extremes						Average	Departure from normal	Monthly extremes			
			Station	Highest	Date	Station	Lowest	Date			Station	Greatest	Station	Least
	°F.	°F.		°F			°F.		In.	In.		In.		In.
Alabama	50.9	+3.2	Chatom	87	7	Gadsden	5	16	7.48	+2.54	Haleyville	16.26	Hayneville	2.38
Arizona	40.9	-2.0	2 Stations	81	°1	Fort Valley	-20	9	1.90	+.59	Junipine	9.13	Yuma WB AP	.11
											Bright Angel RS	8.84		
Arkansas	43.9	+1.1	Camp Chaffee	81	31	Bentonville	-1	16	3.76	-.43	Helena	8.60	Rogers	.50
California	43.2	-2.4	2 Stations	80	°1	Boca	-31	31	7.13	+3.46	Inskip Inn	27.57	Niland	.05
Colorado	21.2	-1.8	Eversoll Ranch	79	2	Taylor Park	-41	7	2.02	+1.08	Wolf Cr Pass 1W	16.01	7 Stations	T
Connecticut	32.5	+2.5	8 Stations	63	°3	Falls Village	-10	°17	5.07	+1.25	Stevenson Dam	7.56	Cream Hill	3.11
Delaware	39.6	+2.9	Lewes	76	7	Newark College Farm	1	17	5.38	+1.96	Milford	6.62	Georgetown	3.74
Florida	61.6	+4.6	Tamiami Tr. 40 Mi Bend	89	23	Marianna Ind. School	19	16	2.58	-.21	Panama City	9.65	2 Stations	.00
Georgia	51.9	+3.5	2 Stations	86	9	Blairsville Exp. Sta.	6	16	6.08	+1.92	Flat Top	14.81	Savannah Beach 2N	2.46
Idaho	22.6	-3.7	3 Stations	57	1	Elk City	-40	24	3.28	+1.32	Burke 2NNE	8.87	May RS	.40
Illinois	29.7	-1.5	Elizabethtown	77	31	Aurora College	-24	16	2.51	+.36	Cairo	7.99	Havana	.62
Indiana	30.8	-.9	2 Stations	75	31	Greensburg 3SW	-20	16	4.76	+2.04	W. Baden Springs Col.	8.52	Gary Post Trib. Bldg.	1.17
Iowa	20.3	-4.1	Sigourney	69	2	2 Stations	-28	27	.99	-.10	Tipton	2.16	Corning 1W	.17
Kansas	31.3	-1.6	Liberal	77	2	do	-13	21	.30	-.55	Fort Scott	1.74	18 Stations	T
Kentucky	39.5	+1.7	Pikeville	85	31	do	-6	16	7.43	+3.59	Bowling Green WB AP	10.85	Inez	4.53
Louisiana	56.1	+4.2	Clinton	87	1	Minden	10	22	5.87	+.52	Sterlington Dam 5	10.03	Buras	1.60
Maine	21.2	-.8	Rockland	60	8	Lac Frontiere	-31	20	4.77	+1.47	Lewiston	6.66	Caribou WB AP	2.38
Maryland	38.3	+3.1	Picardy	80	7	Hancock Fruit Lab.	-18	17	4.73	+1.56	Oakland	6.98	Frederick WB AP	3.01
Massachusetts	31.9	+1.9	2 Stations	65	°5	Birch Hill Dam	-25	28	4.75	+1.16	Willard Brook St. For.	6.89	Chatham	3.16
Michigan	23.8	-.9	Kalamazoo St. Hosp.	67	°3	Kenton U. S. Forest	-30	24	2.68	+.75	Niles	6.30	Channing Sawyer Lake	.87
Minnesota	11.4	-3.9	Winona	61	4	Red Lake Falls	-32	23	1.55	+.79	Itasca State Park	3.68	Hallock	.18
Mississippi	52.3	+4.0	2 Stations	85	6	Booneville	8	16	7.95	+2.67	Booneville	13.42	Gulfport	2.37
Missouri	32.9	-1.0	Anderson 1SW	80	31	4 Stations	-13	°15	1.70	-.48	New Madrid	7.76	Granby	.36
Montana	13.6	-9.2	Harlem	69	1	3 Stations	-38	°20	1.32	+.54	Essex	6.07	Livingston 1S	.08
Nebraska	22.1	-5.1	Valentine Lakes G.R.	72	1	Merriman	-25	21	.71	+.04	Butte	2.50	Harlan County Dam	.09
Nevada	28.6	-3.8	Indian Springs	77	29	Deeth	-30	9	1.69	+.75	Marlette Lake	7.14	Indian Springs	.15
New Hampshire	24.1	+.9	Windham	63	8	Manchester	-28	28	4.25	+1.19	Pinkham Notch	6.62	Bethlehem	2.21
New Jersey	36.5	+2.8	2 Stations	75	7	Layton 3NW	-16	17	5.40	+1.81	Vineland	7.48	Burlington	3.35
New Mexico	35.5	+.1	Carlsbad	83	31	Gavilan	-37	21	.76	+.01	Chama	5.98	4 Stations	.00
New York	27.7	+1.0	4 Stations	68	7	2 Stations	-28	28	4.02	+1.05	Boonville 3SE	8.41	Ellenburg Depot	1.68
North Carolina	44.7	+2.1	New Bern	82	7	Mt. Mitchell	-10	°15	4.59	+.80	Coweeta No. 8	15.34	Enfield 3S	1.83
North Dakota	6.1	-7.9	Hettinger	56	1	2 Stations	-38	°18	.73	+.25	Fargo WB AP	2.19	Bowbells 5E	.10
Ohio	31.7	+.1	3 Stations	78	°7	Newark Water Works	-21	17	4.81	+2.09	Cincinnati Oakley	7.84	Caldwell 4W	2.81
Oklahoma	41.4	+.8	2 Stations	92	30	2 Stations	-4	21	.32	-1.41	Battiest	3.69	3 Stations	.00
Oregon	30.8	-3.5	Brookings	79	11	Seneca	-22	8	5.34	+1.08	Illahe 1N	19.28	2 Stations	.74
Pennsylvania	31.9	+.7	2 Stations	76	°7	3 Stations	-22	17	4.65	+1.54	Pimple Hill	7.91	Retreat 1SW	1.64
Rhode Island	35.3	+2.3	do	63	8	Kingston	-1	17	5.11	+1.29	Austin	6.12	Kingston	4.75
South Carolina	49.2	+2.1	Yemassee 1W	83	10	Union 7SW	9	17	4.46	+.91	Caesars Head	12.21	Lake City	1.57
South Dakota	13.1	-8.9	Van Metre	72	2	Ralph	-36	21	1.37	+.86	Frederick	4.81	3 Stations	.23
Tennessee	43.5	+2.7	Newport	82	7	Allardt	-2	16	8.36	+3.80	Collinwood	12.82	Greeneville Exp. Sta.	3.03
Texas	51.0	+3.0	Cotulla CAA AP	98	6	Dalhart Exp. Sta.	-5	21	.73	-1.31	Neuville	9.62	62 Stations	.00
Utah	23.9	-3.2	Cottonwood Weir	62	1	Scofield Dam	-39	9	2.57	+1.47	Alta	15.43	Hanksville CAA	.05
Vermont	22.6	+.4	Dorset 1S	65	8	Lemington	-31	20	3.88	+1.12	Mays Mill	7.04	Enosburg Falls	1.68
Virginia	39.9	+2.0	2 Stations	79	7	Big Meadows	-6	16	4.51	+1.40	Pennington Gap 1W	8.14	Newport News	1.87
Washington	28.5	-5.1	Walla Walla 3W	65	1	Chewelah 2S	-27	24	4.45	-.53	Wind River	19.59	Sunnyside	.45
West Virginia	36.2	+1.6	Hogsett Gallipolis Dam	84	31	Junction	-18	17	4.83	+1.54	Kumbrabow State For.	7.76	Clendenin	2.14
Wisconsin	18.3	-1.8	2 Stations	64	3	Neillsville	-36	24	1.23	-.02	Racine	2.67	Galesville 3ESE	.40
Wyoming	18.6	-3.5	Torrington Exp. Sta.	70	1	Bondurant	-41	9	1.01	+.23	Moose 3NW	5.44	Rairden	.01
Alaska*	43.5	+.8	Chicagof	80	15	Allakaket	7	29	3.25	+.35	Whittier	28.09	Wales WB AP	.26
Hawaii**	71.9	.0	Mahukona	89	4	Haleakala RS	38	°14	7.01	+.41	Makahanaloa	48.00	7 Stations	.00

° Other dates also.
* September 1951.
** November 1951.

CLIMATOLOGICAL DATA

Table 2

DECEMBER 1951

State and station	Elevation (ground)	Pressure		Temperature								No of days				Precipitation			No of days		Snow, Sleet, Hail		Wind		Fastest mile			No of days (sunrise to sunset)				
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F. or above	Min 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft	Mb.	Mb.	°F	°F	°F	°F	°F		°F				°F	%	In.	In.	In.			In.	In.	M p. h.		M p. h.			0–3	4–7	8–10	0–10	%
ALABAMA																																
Birmingham	610	994.9	1020.9	61	39	49.8	5.1	80	7	14	16	0	12	41	74	8.71	+3.57	3.32	13	2	T	0	9.9	S	38	SW	14	9	8	14	6.1	45
Mobile CO	10	-	--	67	48	57.3	+5.1	78	5	21	16	0	3	-		3.65	-1.37	1.02	16	1	.0	0	13.1	---	42	S	18	7	4	20	7.1	42
Mobile	211	1011.9	1020.2	67	46	56.7	- -	79	6	22	16	0	4	43	76	3.96	--	1.09	13	3	.0	0	12.6	N	---	--	--	6	8	17	6.6	
Montgomery CO	201		--	65	43	53.8	+1.4	82	7	20	16	0	7		—	4.21	.63	1.86	10		.0	0	-					-	-	-	----	--
Montgomery	198	1013.2	1020.1	65	40	52.8	-3.1	83	7	19	16	0	9	43	74	4.05	.79	1.30	12	2	T	0	8.5	S	23	S	20	7	12	12	6.1	52
ARIZONA																																
Flagstaff	6993	784.6	1019.6	38	15	26.7	--	52	27	-8	9	0	29			5.45	---	3.11	9	0	16.4	7	--			---	-	14	6	11	5.6	-
Payson CO	5000	848.0	1017.9	50	27	38.7	-	63	11	11	21	0	21	27	69	2.93	---	.80	9	0	1.4	1	[illegible]	S				12	6	13	5.6	
Phoenix CO	1083	-- --	--	64	41	52.6	+.6	75	1	29	21	0	1	-		.55	-.45	.22	5	0	.0	0	5.8		32	W	5	-		-	---	68
Phoenix	1108	977.0	1016.8	65	39	52.1	----	77	27	26	21	0	7	37	60	.64	.36	.20	6	0	.0	0	4.1	E	---	---	--	12	7	12	4.9	-
Prescott	5014	846.6	1018.2	48	24	36.0		63	1	8	21	0	27	24	62	2.41	-----	1.66	5	0	1.4	1	9.3	SW	38	SW	31	13	3	15	5.2	56
Tucson	2558	926.9	1016.2	63	40	51.5	+.8	78	1	27	21	0	6	35	60	.99	.01	.34	8	0	T	T	6.5	SE	55	S	19	15	5	11	4.5	72
Winslow	4880	851.3	1017.9	46	23	34.8	+2.7	61	28	5	21	0	21	21	58	.64	-.04	.33	5	0	.3	T	7.8	SW	*48	SW	19	12	8	11	5.1	
Yuma	203	1011.5	1016.8	68	43	55.6	-	77	1	34	21	0	0	31	43	.11	---	.06	2	0	.0	0	7.8	NNE	38	W	5	16	8	7	4.0	79
ARKANSAS																																
Fort Smith	458	1000.3	1017.6	53	31	42.0	-.2	82	31	11	21	0	19	36	69	1.34	-1.42	.74	5	3	T	T	9.7	NE	30	SW	31	10	5	16	6.0	41
Little Rock	257	1008.8	1018.1	55	36	45.0	-.8	80	31	15	16	0	16	36	73	5.29	+1.15	1.47	13	4	T	0	10.4	SSW	40	NE	4	9	5	17	6.5	46
Texarkana	361	1004.4	1017.9	60	38	48.8	+1.2	82	31	16	21	0	12	39	73	2.38	2.48	.55	8	3	.0	0	11.4	SSE	52	WSW	4	8	7	16	6.4	76
CALIFORNIA																																
Bakersfield	489	1001.7	1020.2	57	37	46.8	1.3	69	26	26	9	0	10	39	75	1.76	+.90	.51	9	0	T	0	3.2	NW	*25	WNW	11	9	6	16	6.3	-
Beaumont CO	2589	----	------	54	36	44.9	-----	70	17	27	6	0	9	--	--	6.72	--	3.33	12	0	T	0		---	---	---	---	13	5	13	5.4	
Bishop	4108	873.7	1017.3	48	22	34.7	----	60	18	10	9	0	31	--	-	4.20	----	1.42	11	0	4.0	3	-	-	-	-	-	11	5	15	5.9	-
Blue Canyon	5280	836.4	1017.3	39	27	32.9	--	58	14	13	31	0	26	--	--	18.84		3.75	16	0	80.9	38	--	-	-	---	--	8	6	17	6.9	
Burbank	[illegible]	991.5	1017.9	62	42	51.7	----	71	10	33	9	0	0	36	62	5.07		2.28	9	1	T	T	5.2	NW	*45	NE	9	14	3	11	4.9	---
Eureka CO	[illegible]	1016.3	1018.6	52	41	46.5	1.7	62	10	30	7	0	2			9.10	+2.82	1.48	17	2	T	T	7.4	-	15	S	4	3	6	22	8.0	29
Fresno	[illegible]	1008.1	1020.0	54	35	44.8	-.3	68	26	25	9	0	12	40	81	2.82	+1.37	.75	12	0	T	T	6.2	SE	29	NW	1	6	7	18	7.2	56
Los Angeles CO	312	-	-	62	46	54.3	-2.3	70	27	32	9	0	1			5.80	+3.17	2.86	9	1	.0	0	6.9	--	29	N	7	14	3	14	5.1	61
Los Angeles	99	1014.6	1018.1	63	45	54.0	-	71	10	33	6	0	0	41	65	4.63	- --	3.01	10	0	.0	0	6.7	W			--	13	8	10	4.9	--
Mt. Shasta CO	3543	891.6	1018.4	39	24	31.3	-3.5	51	12	10	9	0	31	25	79	9.88	+4.12	2.88	14	0	31.9	11	7.8	SE	*26	NW	19	6	6	19	7.1	
Oakland	6	1019.0	1019.4	55	42	48.3	+.5	63	1	32	21	0	4	40	75	8.36	+4.90	2.21	13	0	T	T	6.3	SSE	-	---	--	9	7	15	6.2	-
Red Bluff	341	1005.4	1018.5	53	37	44.9	1.2	73	11	28	31	0	8	35	71	4.54	+.14	1.58	10	1	T	T	8.7	NW	59	SE	1	12	5	14	6.0	54
Sacramento	17	1018.3	1019.1	53	37	44.8	1.4	62	27	28	9	0	11	40	82	4.71	-1.68	1.80	11	0	.0	0	12.0	SSE	62	S	3	10	6	15	6.2	41
Sandberg CO	4517	862.2	1018.3	43	31	37.1	-----	52	23	19	9	0	15	25	67	2.77	-- --	1.58	9	0	4.0	4	22.3	S	---	.	-	10	6	15	5.8	--
San Diego	19	1014.6	1017.7	63	48	55.5	.0	69	27	37	9	0	0	41	68	3.87	+2.00	2.04	12	0	T	T	5.9	N	31	S	19	12	9	10	4.6	65
San Francisco CO	52	---	- -	55	45	50.0	-1.3	61	1	38	31	0	0	--	--	7.92	+3.97	1.74	16	0	T	0	8.1		32	W	1	9	5	17	6.9	42
San Francisco	1	1018.3	1019.1	55	42	48.5	+.6	63	11	32	10	0	1	42	78	7.05	+3.08	1.70	16	0	T	0	9.6	SSE	18	WSW	1	8	8	15	6.0	--
Santa Catalina	1568	960.7	1017.6	57	46	51.2	-----	67	27	40	31	0	0	--		5.53	-----	2.68	11	0	.0	0	---	--	---	---	--	14	6	11	4.8	-
Santa Maria	231	1010.8	1019.3	60	39	49.2	----	67	10	29	10	0	1	41	74	3.60	-----	.71	11	0	.0	0	7.9	E	*30	NNE	9	11	8	12	5.1	-
COLORADO																																
Alamosa	7534	766.7	1019.8	34	3	18.9	---	49	1	-19	21	0	30	--	-	.38	----	.30	5	0	2.9	1	---		-	-	--	15	9	7	4.4	--
Colorado Springs	6175	804.6	1014.5	43	16	29.8	- -	65	1	2	14	0	28	8	45	.11	-----	.05	3	0	1.3	1	12.1	NNW	*38	NW	2	16	5	10	4.3	--
Denver	5292	832.0	1013.7	41	17	29.0	-.9	65	1	-10	20	0	29	12	54	.69	+.29	.40	7	0	11.2	5	8.8	S	44	NW	17	17	4	10	4.7	61
Grand Junction	4849	858.8	1021.1	32	14	23.0	-4.5	46	2	1	21	0	31	16	77	1.89	+1.26	1.16	10	0	8.3	2	5.2	NW	48	NW	31	9	7	15	6.4	51
Pueblo	4799	851.3	1013.7	47	16	31.3	+1.2	69	1	9	15	0	28	13	51	.28	-.22	.25	3	0	5.7	5	10.3	NW	56	W	22	19	8	4	3.8	60
CONNECTICUT																																
Bridgeport	7	1019.0	1019.7	44	28	36.0	- ---	63	8	5	17	0	21	27	72	4.31	----	1.14	9	1	3.7	2	13.6	WNW	35	S	18	7	9	15	6.7	--
Hartford	15	1012.9	1018.9	41	23	32.2	+2.4	62	8	1	17	0	25	21	72	5.36	+1.39	1.39	11	1	9.7	5	7.6	NNW	32	NW	15	5	7	19	7.3	49
New Haven	6	1014.9	------	43	28	35.3	+4.4	62	8	7	17	0	22	-	--	4.11	+.71	1.08	11	0	4.6	3	8.0	---	34	S	18	7	6	18	6.9	52
DELAWARE																																
Wilmington	73	1016.9	1019.9	47	29	37.6	--	71	7	6	17	0	21	29	72	5.79	--	1.82	12	0	6.6	7	8.2	WNW	---	---	--	7	9	15	6.5	--
FLORIDA																																
Apalachicola	13	1019.0	1020.3	65	52	58.4	+2.7	78	4	28	16	0	2			2.28	2.84	1.22	9	1	.0	0	9.1	--	26	NW	15	8	9	14	6.4	37
Daytona Beach	33	1019.6	1021.0	74	54	64.0	+5.0	84	21	36	16	0	6	58	84	2.88	+.14	1.93	8	0	.0	0	9.7	NNW	*34	NNW	27	7	8	15	6.1	-
Fort Myers	15	1019.6	1020.1	80	58	68.8	+3.8	86	23	43	13	0	0	61	81	.14	-1.42	.08	3	0	.0	0	8.2	E	---	---	--	7	15	9	5.5	--
Jacksonville CO	18	-----	------	70	53	61.5	+5.1	82	8	28	16	0	1		--	2.61	-.41	1.39	10	0	.0	0	----	---	---	---	--	--	--	--	----	--
Jacksonville	52	1020.0	1021.1	70	50	59.8	+5.8	82	8	27	16	0	1	53	82	2.73	-.29	.93	11	0	.0	0	6.7	NNE	36	NE	27	5	9	17	7.1	47
Key West CO	5	1018.3	1019.0	81	70	75.6	+5.3	85	23	56	15	0	0	-	--	1.12	-.55	1.00	4	1	.0	0	8.6	NE	22	NW	27	12	11	8	5.0	71
Key West	6	1018.6	1019.2	79	69	74.2	+4.4	84	5	57	13	0	0	67	79	1.59	-.08	1.22	8	1	.0	0	12.9	E	---	---	-	13	11	4	4.5	-
Lakeland CO	214	- -	-- --	75	56	65.8	+2.5	82	30	37	16	0	0	-		2.38	-.02	1.05	5	0	.0	0	- --	E		---	--	9	10	12	5.9	--
Melbourne	22	1019.6	1020.6	76	59	67.6	+5.0	85	21	42	16	0	0	61	82	1.49	-.65	.72	5	1	.0	0	9.0	SE	*30	N	27	8	9	14	6.0	--
Miami CO	180	------		77	69	72.9	+3.8	81	24	50	16	0	0	--	--	.45	-1.53	.21	4	0	.0	0	12.8	SE	47	NE	27	10	12	9	5.2	58
Miami	9	1018.6	1019.7	79	66	72.5	-----	83	21	47	13	0	0	63	75	1.06	-----	.65	3	0	.0	0	9.0	E	*32	NNE	27	13	8	10	5.0	--
Miami Beach	3	------	------	78	70	73.9	-----	80	21	52	16	0	0			.12	---	.07	3	0	.0	0	-	SE	-	---	--	14	10	7	----	--
Orlando	111	1016.6	1021.2	76	55	65.1	+5.8	85	21	36	16	0	0	58	81	2.06	-.29	.93	6	1	.0	0	9.6	S	*32	S	18	10	8	13	6.0	--
Pensacola CO	13	1018.0	--	66	49	57.9	+3.9	77	5	25	16	0	3		--	3.30	-1.35	1.04	13	3	.0	0	8.8	---	26	N	14	5	12	14	6.8	54
Pensacola	110	-	1020.2	-		---	----				-	-	--	50	--	---	-----	---	--		----	--	----	--	---	---	--	-	-	-	-----	---
Tallahassee	64	1018.6	1021.1	68	49	58.5	--	79	9	26	16	0	2	50	78	4.77	-----	1.11	10	3	.0	0	6.6	SSE	--	-	-	6	6	19	7.2	--
Tampa	21	1019.3	1020.7	76	56	66.0	+4.9	85	7	39	16	0	0	58	81	2.15	+.08	.62	6	0	.0	0	7.6	E	28	S	14	7	10	14	6.4	48
West Palm Beach	15	1019.0	1019.9	80	63	71.7		87	15	42	13	0	0	63	79	.71	-1.79	.19	10	0	.0	0	9.3	ESE	---	- -	--	10	9	12	6.0	-
GEORGIA																																
Albany	190	1014.6	1021.7	66	45	55.5	+2.8	80	8	22	16	0	6	46	74	4.79	+.70	1.24	11	5	.0	0	6.0	SSE	---			5	10	16	6.7	--
Atlanta CO	1054	-	--	56	38	47.2	+2.5	72	7	10	16	0	11	-		8.52	+3.00	3.92	10	--	----	--	----	--	-	--	--	--	--	-	----	--
Atlanta	977	978.3	1021.1	57	37	47.2	+3.0	74	7	12	16	0	11	38	71	8.36	+3.57	3.34	12	2	T	T	9.2	NNW	41	NW	15	7	9	15	6.6	18
Athens	798	991.5	----	56	37	46.4	-----	72	31	13	16	0	12			6.42	-----	1.95	17	1	.0	T	----	---	---	---	--	6	9	16	6.5	-
Augusta	124	1014.6	1021.4	62	38	50.0	+1.9	81	8	17	17	0	9	42	78	3.31	+.45	1.67	11	0	.0	0	5.9	NW	*21	WNW	15	6	4	21	7.2	--
Columbus	382	1006.8	1021.3	64	39	51.5	----	78	7	17	16	0	9	43	76	5.65	-----	1.50	13	1	.0	0	8.5	S	---		-	7	8	16	6.6	--
Macon	354	1007.1	1020.8	64	40	52.0	- --	79	7	18	16	0	8	42	73	4.68		1.34	12	2	.0	0	9.8	NW	35	SW	9	6	7	18	6.8	50
Rome	637	998.0	1021.2	58	32	45.1	-----	78	7	11	16	0	16	37	76	11.04	-----	3.15	13	1	T	0	9.1	N	---	--	--	5	14	12	6.3	--
Savannah	38	1019.0	1022.0	69	45	55.7	+5.0	81	8	24	16	0	4	47	78	3.75	+.82	1.21	9	1	.0	0	8.2	NE	27	NW	15	5	8	18	6.8	10
Valdosta	200	1012.5	1021.1	68	47	57.9	+1.3	82	8	23	16	0	3	48	--	6.33	+2.10	2.21	10	3	.0	0	9.8	S	---		-	6	9	16	6.9	--
IDAHO																																
Boise	2842	919.7	1018.9	34	21	27.5	-2.8	53	1	5	9	0	28	22	80	2.47	+.90	.52	18	0	15.6	6	8.3	SE	37	SE	4	3	4	21	8.2	28
Lewiston	1413	963.8	1017.3	37	23	29.8		53	1	2	31	0	27	24	78	.72	----	.22	11	0	7.2	3	4.9	E	- -	---	--	0	4	27	9.1	--
Pocatello	4444	861.8	1018.8	30	16	22.9	-2.4	48	1	9	9	0	29	18	81	1.58	-.43	.72	15	1	19.9	8	12.8	SW	45	SE	4	3	5	23	8.4	15
ILLINOIS																																
Cairo CO	314	1005.1	-- -	48	34	40.9	+3.1	73	31	9	16	0	16	--		7.99	+4.59	2.14	11	3	1.3	1	10.5	--	35	SW	31	5	7	19	7.5	10
Chicago	618	992.6	1016.5	35	18	26.2	-.7	65	6	-12	16	0	23	19	75	2.76	+.69	.64	10	1	33.3	17	9.9	S	42	S	6	9	5	17	6.8	42
Joliet	580	994.2	1016.6	34	14	23.9	-2.0	63	6	-20	27	0	24	18	82	2.40	+.62	.53	11	1	21.9	15	12.9	SW	---	---	--	7	6	18	6.8	-
Moline	589	993.9	1017.1	33	14	23.4	-2.3	67	3	13	27	0	25	17	76	1.28	-.20	.39	10	1	16.7	12	12.4	SW	47	SW	6	8	7	16	6.9	37
Peoria	659	992.9	1017.1	36	16	26.1	-2.0	65	6	-14	16	0	24	20	79	1.16	-.61	.38	10	1	9.8	8	12.7	WNW	42	SW	6	7	5	19	7.0	38
Springfield	598	992.6	1016.9	38	20	28.9	-.8	66	6	-12	16	0	22	22	77	1.55	-.63	.60	11	0	8.4	6	15.0	S	43	S	6	5	7	19	7.5	38

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure: Station	Pressure: Sea level	Temperature: Average maximum	Temperature: Average minimum	Temperature: Average	Temperature: Departure from normal	Temperature: Highest	Date	Temperature: Lowest	Date	No. of days: Max. 90° F or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Wind: Average hourly speed	Wind: Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	No. of days (sunrise to sunset): Clear	No. of days (sunrise to sunset): Partly cloudy	No. of days (sunrise to sunset): Cloudy	Sky cover, tenths (sunrise to sunset)	Possible sunshine
	Ft.	Mb.	Mb.	°F	°F	°F	°F.	°F		°F.				°F	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
INDIANA																																
Evansville	385	1002.4	1018.7	46	29	37.2	+2.4	75	31	3	16	0	19	30	78	7.95	+4.41	2.03	12	3	2.0	T	11.4	SSE	36	SW	6	4	10	17	7.5	30
Fort Wayne	801	984.4	1016.9	36	19	27.4	-1.2	64	6	-14	16	0	22	22	63	3.78	+1.20	.97	13	0	11.4	9	10.6	WSW	32	SW	21	8	6	17	6.9	43
Indianapolis	796	987.5	1017.9	40	22	30.6	-.3	68	31	-15	16	0	21	21	80	4.68	+1.70	1.80	14	0	6.8	6	13.1	SE	16	W	21	6	6	19	7.2	16
South Bend	708	987.5	1016.6	35	18	26.3	-1.1	63	6	-16	16	0	25	21	81	3.69	+1.45	1.00	17	1	30.7	16	13.6	SW	*35	SW	21	6	3	22	7.4	-
Terre Haute	585	997.6	1018.3	40	23	31.4	-1.1	67	31	-14	16	0	20	21	77	3.24	+.31	.72	13	1	8.8	7	9.7	S	12	SE	6	4	8	19	7.6	33
IOWA																																
Burlington	605	990.2	1016.8	34	14	24.3	-3.0	67	3	-15	15	0	26	17	75	1.13	-.50	.51	10	0	13.5	10	12.0	WNW	40	SW	6	5	6	20	7.3	51
Charles City CO	1013	976.3	---	26	10	18.2	-2.2	59	3	-17	27	0	25			1.09	-.21	.39	13	0	12.4	9	7.1	-	31	SW	6	5	9	17	6.7	38
Davenport CO	579	993.9	--- ---	33	17	25.0	-2.1	67	3	-10	15	0	24			1.98	+.50	.65	12	1	19.5	12									--	--
Des Moines	800	984.1	1016.8	29	12	20.5	-5.5	62	3	-15	15	0	26	14	75	.93	-.29	.43	9	0	12.0	9	13.3	NW	61	SW	6	3	6	22	7.6	30
Dubuque	641	974.9	1015.6	29	10	19.4		64	3	-17	16	0	26	14	80	2.03	----	.74	11	1	20.5	19	11.8	SW	38	SW	6	8	6	17	6.8	-
Sioux City	1097	973.2	1016.6	27	8	17.6	-4.0	57	2	-17	27	0	27	11	75	.91	+.01	.19	12	0	11.1	8	10.4	NW	38	W	3	4	6	21	7.6	46
KANSAS																																
Concordia CO	1375	964.8	---	37	19	28.0	-2.7	63	2	-5	15	0	28		-	.23	-.40	.11	4	0	2.5	2	8.6		30	W	6	6	8	17	6.8	47
Dodge City	2594	924.8	1015.1	46	19	32.2	-.4	72	30	-2	15	0	27	18	65	.02	-.55	.02	2	0	.5	1	16.0	N	48	NW	6	10	8	13	5.7	61
Goodland	3645	882.5	1014.9	39	12	25.6	-4.3	69	2	-9	15	0	31	15	71	.18	-.45	.10	4	0	3.6	2	13.1	NW	*40	WNW	6	7	10	14	6.3	--
Topeka	926	979.7	1016.8	39	20	29.5	----	69	2	-4	15	0	25	22	77	.43	----	.15	4	0	4.9	3	12.1	NW	61	S	3	7	5	19	6.7	48
Wichita	1372	965.8	1015.9	44	23	33.7	-.9	70	31	0	15	0	24	23	69	.24	-.76	.08	4	0	2.2	1	15.3	S	45	S	19	10	5	16	6.0	58
KENTUCKY																																
Lexington	979	982.4	1019.1	47	28	37.6	+1.8	72	31	0	16	0	20	29	74	7.30	+3.53	1.47	14	2	4.2	1	13.5	SSE				7	5	19	7.0	--
Louisville CO	457	---	---	47	31	38.7	+1.1	72	7	1	16	0	16	--	-	6.90	+3.16	1.36	12	2	2.3	1	-	-	-	---	-					--
Louisville	485	1001.7	1018.6	47	29	38.2	+1.9	72	7	1	16	0	19	30	75	6.85	+3.11	1.42	13	2	2.3	1	8.9	S	47	S	7	7	4	20	7.2	38
LOUISIANA																																
Baton Rouge	64	1016.3	1019.0	69	47	58.0	+4.5	82	7	23	16	0	5	48	76	4.87	-.72	1.68	11	2	.0	0	11.8	S	--	--	--	9	9	13	6.1	--
Lake Charles	12	1017.3	1018.6	68	48	57.6	+4.2	80	7	28	16	0	5	51	84	6.08	+.45	1.85	11	1	.0	0	14.2	S				8	5	18	6.6	
New Orleans CO	12	1019.6	-	70	52	60.8	+5.2	83	7	27	16	0	1			3.30	-1.49	1.00	11	2	.0	0	7.8		20	NW	15	9	11	11	5.6	52
New Orleans	12	1018.6	1019.5	70	50	59.8		83	7	29	16	0	1	51	80	3.17	----	.80	11	2	T	0	11.9	S	*43	W	5	8	10	13	6.0	
Shreveport	174	1008.8	1018.2	63	40	51.6	+2.3	83	30	18	16	0	9	42	75	7.23	+2.94	2.32	11	1	.0	0	11.8	SSE	37	NW	14	8	7	16	6.2	55
MAINE																																
Caribou	624	992.1	1015.7	23	6	14.3	+1.1	47	6	-24	20	0	28	7	69	2.38	-.14	.61	17	0	29.9	20	11.4	W	55	WNW	19	5	5	21	7.4	--
Eastport	33	1013.9	1014.2	36	20	27.6	+1.3	57	8	-6	17	0	21			5.72	+1.98	1.56	19	0	35.2	11	11.6	-	54	S	18	6	9	16	7.0	40
Portland	61	1013.5	1017.6	36	15	25.4	+.1	58	8	-13	28	0	27	21	82	6.56	+2.59	1.71	15	1	29.1	11	8.2	WNW	42	SE	18	11	9	11	5.7	54
MARYLAND																																
Baltimore CO	14	-----	------	48	34	41.1	+3.9	75	7	12	16	0	14	--		5.02	+1.65	1.51	12	--	---	--	----	---	--	---	--	-	-	--	--	-
Baltimore	146	1015.9	1020.5	47	30	38.4		74	7	5	17	0	21	28	70	4.49		1.36	12	0	5.4	1	11.2	WNW	42	NW	15	10	9	12	6.4	44
Frederick	294	--	------	46	25	35.7	--	72	8	0	20	0	23			3.01		1.08	12	0	13.8	9					--	--	--	-	----	
MASSACHUSETTS																																
Boston	12	1013.2	1017.8	43	28	35.0	+2.5	64	8	9	17	0	19	24	67	4.69	+1.24	1.44	11	1	8.4	5	12.6	WNW	38	S	21	9	10	12	5.7	58
Nantucket	43	1018.0	1018.6	45	31	37.7	+1.9	56	8	15	17	0	19	30	75	5.27	+1.53	1.30	12	1	2.9	2	13.2	NW	15	SE	18	5	10	16	7.1	42
Pittsfield	1153	973.9	1017.6	36	18	26.8	+1.9	61	7	-12	20	0	24		-	3.63	+.53	.79	15	0	23.3	15	9.2	-	--	-	--	4	10	17	7.1	-
MICHIGAN																																
Alpena CO	587	991.5	-----	31	19	24.7	-.1	53	7	5	19	0	25	--	--	2.06	-.02	.58	20	0	26.4	20	11.1	-	36	SE	20	1	9	21	8.4	28
Detroit	619	988.8	1016.5	36	21	28.4	-.5	62	7	-3	16	0	23	22	79	3.50	+1.15	.84	17	0	24.0	16	10.9	S	38	SW	21	6	8	17	7.0	43
Escanaba CO	591	991.2	------	27	14	20.6	-1.8	47	3	-9	16	0	26	--	--	1.32	-.43	.42	11	1	17.7	13	10.2		34	N	13	7	6	18	6.8	49
Grand Rapids	638	989.5	1015.9	31	19	26.2	-.4	63	6	-6	26	0	25	22	83	3.65	+1.08	.53	19	2	51.3	23	11.8	W	36	SW	7	1	5	22	8.1	20
Lansing	839	983.1	1016.4	33	18	25.6	-1.3	63	7	-6	19	0	24	20	82	3.09	+1.02	.65	20	0	27.8	20	13.9	SSW	41	SW	6	4	7	20	7.6	24
Marquette CO	677	985.8		27	16	21.3	-1.3	51	3	-8	16	0	27			1.55	-1.11	.38	15	0	15.9	12	8.6		31	S	3	4	8	19	7.7	34
Muskegon	627	991.5	1015.5	33	22	27.6	-1.5	63	6	-4	26	0	25	22	80	2.52	+.60	.60	20	1	30.5	19	11.8	WNW	*32	S	6	4	2	25	8.4	-
Sault Ste. Marie	721	991.2	1014.3	25	11	18.1	.7	48	4	-16	19	0	28	14	83	2.51	+.28	.33	23	0	33.8	15	9.4	E	33	SW	7	1	8	22	8.3	33
Ypsilanti	722	987.1	1016.4	35	19	27.1		63	3	-9	17	0	23	20	78	3.95		1.17	15	0	25.1	15	11.3	SW	*33	SW	21	5	11	15	6.8	
MINNESOTA																																
Duluth	1128	971.2	1014.6	19	3	11.0	---	50	3	-19	16	0	30	1	75	1.71		.48	17	0	19.0	14	12.3	WNW	47	NE	6	9	3	19	6.8	43
Intern'l. Falls	1179	970.2	1016.0	14	-4	5.4	-4.4	49	3	-26	16	0	29	1	82	1.15	+.32	.38	18	0	12.7	9									7.0	
Minneapolis	830	981.0	1016.3	23	9	16.4	-3.2	57		-16	24	0	26	11	78	1.21	+.23	.34	15	0	16.5	11	11.1	W	42	S	3	7	5	19	7.1	38
Rochester	1014	977.0	1016.0	21	8	16.1	-3.0	58	3	-22	27	0	27	11	76	.80	-.18	.18	14	0	13.4	10	10.5	W		-	-	5	6	20	7.4	39
St. Cloud	1034	975.3	1015.6	21	3	11.7	-4.8	55	3	-25	24	0	29	7	79	1.65	+1.05	.34	17	0	14.0	11	7.8	WNW	-	---	--	10	3	18	6.5	--
St. Paul	703	987.8	1015.6	24	10	17.0	-2.0	56	3	-17	24	0	25	11	78	1.36	+.30	.30	16	0	12.8	9	9.0	WSW	*33	SSW	3	6	7	18	7.1	--
MISSISSIPPI																																
Jackson	315	1007.5	1019.4	65	41	52.8	+3.7	84	6	19	16	0	10	42	73	5.95	+.19	1.53	13	4	.0	0	11.4	SE	59	NW	14	12	5	14	5.6	57
Meridian	294	1005.4	1019.8	65	40	52.7	+7.0	82	6	18	16	0	11	43	74	6.73	+1.50	2.49	11	4	.0	0	8.1	NW				10	7	14	5.9	
Vicksburg	234	1010.8	----	64	44	53.6	+3.6	82	6	20	16	0	8			6.37	+1.04	1.69	14	5	.0	0	11.3		35	W	4	8	9	14	6.4	53
MISSOURI																																
Columbia	733	987.1	1016.7	40	22	31.0	-2.1	73	6	-2	21	0	22	22	74	1.49	-.37	.48	9	0	6.2	3	12.1	S	43	SW	6	5	8	18	7.1	46
Kansas City	741	980.7	1016.7	39	22	30.7	-1.8	69	2	-2	15	0	23	22	71	.70	-.50	.25	7	0	3.5	2	10.2	SSW	57	SW	6	6	5	20	7.3	30
St. Joseph	809	970.3	1016.4	36	17	26.8	-2.8	66	2	-5	15	0	25	17	73	.96	-.33	.39	5	0	8.8	4	11.8	NW	59	S	6	8	6	17	6.6	42
St. Louis CO	465	996.3	----	43	27	35.0	+.1	73	31	1	15	0	20		-	2.44	+.23	.76	12	1	1.8	1	12.8		56	SW	6	3	7	21	7.8	36
St. Louis	465	996.3	1017.5	42	25	33.6	+.2	74	31	1	15	0	21	26	75	1.82	+.09	.49	9	1	.9	1	11.3	NW	--	--	--	4	7	20	7.7	
Springfield	1265	967.5	1016.5	45	25	34.7	-.8	76	31	0	21	0	22	26	74	1.19	-1.12	.37	8	0	1.1	T	15.5	SSE	50	S	6	4	11	16	7.0	40
MONTANA																																
Billings	3568	886.9	1015.7	28	10	19.2	-7.0	56	1	-15	20	0	29	7	63	1.04	----	.27	10	0	15.8	9	10.4	WSW	40	NW	2	3	8	20	7.7	30
Butte	5530	823.2	1018.3	25	2	13.6	-6.8	44	1	-25	31	0	31	7	74	1.18	+.74	.26	13	0	19.1	12	8.4	NW	--	---	--	2	5	24	8.3	--
Glasgow CO	2090	939.4	1018.4	18	-2	8.0	-7.6	59	1	-24	21	0	30	0	71	.79	+.29	.31	12	0	6.0	4	----	---	---	-	-	3	10	18	7.4	--
Great Falls	3664	884.2	1016.4	24	6	15.2	-12.8	57	1	-22	31	0	29	6	70	1.71	+1.06	.30	14	0	22.9	12	14.0	SSW	50	SW	1	2	9	20	7.8	28
Havre CO	2488	924.5	1018.3	20	1	10.2	-10.2	62	1	-25	31	0	29	-	--	1.02	+.41	.33	14	0	14.4	9	8.4	--	32	SW	1	6	8	17	6.8	34
Helena	3893	869.6	1018.8	25	4	14.5	-8.2	53	1	-25	26	0	29	5	70	1.08	+.61	.28	12	0	22.6	12	7.2	W	43	W	11	2	3	21	8.1	32
Kalispell	2965	908.9	1017.1	24	8	16.0	------	50	1	-22	26	0	31	10	75	3.11	----	.94	23	0	49.7	30	8.0	NNE	--	---	-	2	3	26	9.0	--
Miles City	2629	929.2	1018.1	21	-1	9.9	-	48	1	-31	20	0	31	5		1.14	----	.33	16	0	15.0	9	9.8	SSE	--	--	-	5	9	17	7.1	--
Missoula	3201	899.1	1018.0	28	11	19.4	-2.0	50	1	-20	26	0	31	13	74	1.81	+.86	.29	23	0	25.0	13	5.8	E	31	NW	29	2	1	28	8.9	20
NEBRASKA																																
Grand Island	1841	947.5	1016.2	31	12	21.6	--	59	1	-15	15	0	29	14	78	.46	--	.41	5	0	9.0	8	12.6	NW	--	--	--	8	5	18	6.8	--
Lincoln CO	1181	---	-----	31	15	22.7	-4.9	60	2	-10	15	0	26	--	-	.74	-.06	.49	7	0	9.4	6	9.4	---	35	W	3		--	-	---	54
Lincoln	1180	971.2	1016.5	31	13	21.8	-4.0	61	2	-10	15	0	27	15	--	.39	-.41	.22	7	0	6.6	6	9.1	WNW	--	---	--	6	6	19	7.0	--
Norfolk	1554	958.3	1016.6	27	9	18.0	-6.5	58	1	-17	15	0	28	11	79	.55	-.29	.30	9	0	8.0	7	14.8	NW	---	---	--	8	4	19	6.9	--
North Platte	2783	913.0	1015.7	32	10	21.3	-5.4	63	1	-14	21	0	31	13	75	.62	+.09	.29	4	0	6.3	3	9.8	WNW	37	NW	6	6	9	16	6.8	49
Omaha	978	975.6	1016.9	29	11	20.1	-6.3	62	3	-12	15	0	27	15	79	.97	+.04	.41	9	0	16.7	13	12.0	SSE	43	SW	6	5	9	17	7.1	41
Scottsbluff	3950	874.7	1015.3	35	11	23.1	-5.3	68	1	-14	20	0	31	11	65	.45	-.07	.13	7	0	4.0	1	9.8	NW	-			8	8	15	6.3	--
Valentine CO	2581	920.4	------	27	6	16.1	-8.5	69	1	-18	21	0	31	-	--	1.37	+.36	.64	9	0	19.5	14	9.3	---	34	W	6	5	8	18	7.2	48

See footnotes at end of table.

CLIMATOLOGICAL DATA

Table 2-Continued

DECEMBER 1951

State and station	Elevation (ground)	Pressure		Temperature								No. of days		Average dew point	Average relative humidity	Precipitation			No. of days		Snow, Sleet, Hail		Wind					No of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min 32° F. or below			Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile Speed	Fastest mile Direction	Fastest mile Date	Clear	Partly cloudy	Cloudy		
	Ft	Mb	Mb	°F	°F	°F	°F	°F		°F.				°F	%	In	In.	In.			In	In.	M p. h.		M. p h			0-3	4-7	8-10	0-10	%
NEVADA																																
Elko	5075	840.5	1019.9	31	8	19.5	---	47	27	-21	9	0	30	13	77	1.46	-	0.55	13	0	12.1	5	6.6	W	*40	WNW	3	4	6	21	7.5	--
Ely	6257	806.6	1020.7	32	5	18.4	-6.1	44	22	-22	9	0	31			1.54	+.66	.76	10	1	14.4	8	11.4		47	SE	4	8	6	17	6.5	50
Las Vegas	2162	942.4	1017.1	53	31	42.3	-1.1	67	28	21	9	0	22	22	47	.23	-.19	.11	3	0	.0	0	7.2	SW	---	---	--	14	4	13	4.9	71
Reno	4397	860.8	1017.9	41	20	30.5	-1.4	57	27	3	31	0	30	21	70	1.95	+.97	.77	11	0	8.5	4	6.7	WNW	61	W	30	7	14	10	6.2	44
Winnemucca	4299	867.6	1019.3	36	17	26.2	-3.8	50	27	-6	9	0	28	20	74	1.60	+.52	.52	13	0	8.2	4	9.4	---	50	W	4	5	3	23	7.5	38
NEW HAMPSHIRE																																
Concord	339	1006.8	1018.0	36	13	24.7	+.7	58	8	-22	17	0	25	18	75	4.41	+1.28	1.01	15	1	21.8	14	5.4	NW	29	W	19	8	10	13	6.2	60
NEW JERSEY																																
Atlantic City CO	8	1017.6	1019.3	48	34	41.1	+4.7	67	9	12	17	0	16	-	-	4.83	+.89	1.87	13	1	1.6	2	16.9	-	57	S	21	6	10	15	6.5	44
Newark	11	1018.6	1019.5	45	30	37.2	+3.8	66	7	6	17	0	18	27	69	4.85	+1.08	1.26	11	0	4.9	1	10.3	W	*58	WNW	15	6	9	16	6.8	—
Trenton CO	56	1012.5	1019.6	46	30	38.0	+3.6	70	7	4	17	0	17	-	-	5.15	+1.80	1.35	10	0	7.5	6	9.3	---	43	W	15	6	9	16	6.6	56
NEW MEXICO																																
Albuquerque	5310	847.3	1016.5	47	25	36.2	+1.7	62	30	9	21	0	24	19	51	.28	-.18	.25	3	0	3.0	3	8.2	SE	55	NW	4	14	9	8	4.6	64
Clayton	4969	840.5	1013.2	50	19	34.4	-.4	69	1	2	20	0	27	19	58	.10	-.38	.06	2	0	1.4	1	--	---	-			16	9	6	4.3	--
Raton	6379	799.5	1013.4	46	16	30.6	-	61	1	-3	10	0	29	-	-	.16	-----	.09	6	0	1.6	1	---		-	--	--	16	9	6	3.8	
Roswell	3611	892.0	1015.4	57	27	41.9	+.7	77	30	10	10	0	21	21	50	.61	-.05	.56	3	0	5.5	5	10.4	SSE	60	NW	4	17	4	10	4.3	68
NEW YORK																																
Albany	277	1015.9	1018.1	36	18	27.1	+1.6	61	6	-19	20	0	25	21	75	3.58	+.97	.65	13	0	20.5	12	8.2	SSE	42	W	15	4	11	16	6.9	44
Bear Mountain	1300	---	---	38	24	30.8	-	61	8	-7	17	0	21	-		5.96	-----	1.67	12	0	13.6	7	---	-		--	--	7	5	19	7.0	
Binghamton	1601	957.0	1017.3	35	20	27.1	-----	62	7	-5	17	0	24	22	79	3.30	--	.67	16	0	20.7	9	16.1	WNW	43	W	15	1	7	23	8.4	34
Buffalo	693	988.5	1017.1	37	24	30.6	+1.8	66	7	5	16	0	22	24	79	3.35	+.01	.73	19	1	31.6	16	16.1	W	59	SW	21	2	6	23	8.1	29
New York CO	10	1007.1	----	46	32	39.0	+4.0	66	7	8	17	0	16	--		3.99	+.37	1.27	11	0	3.4	3	15.9	----	77	NW	19	6	12	13	6.6	52
New York	19	1018.3	1019.4	46	32	39.0	---	64	8	9	17	0	16	27	63	5.25	---	1.45	14	0	3.6	2	12.5	WSW	56	NW	9	6	9	16	6.9	--
Oswego	292	1003.7	1016.6	38	25	31.0	+2.9	61	7	1	19	0	20	--	-	3.63	+.13	.53	21	0	32.4	11	11.4		33	NW	15	1	4	26	8.9	14
Rochester	543	997.0	1016.8	37	23	30.0	+1.4	64	7	2	19	0	21	25	80	3.14	+.42	.55	22	1	23.6	12	12.1	WSW	41	SW	*21	3	7	21	7.9	29
Syracuse	399	994.9	1017.7	38	23	30.2	+2.8	64	7	-8	20	0	23	23	74	4.34	+1.26	.61	18	0	38.2	15	11.4	W	34	W	27	2	4	25	8.7	21
NORTH CAROLINA																																
Asheville CO	2203	-----	---	52	30	41.1	+3.3	81	31	5	16	0	19	-		4.79	+1.59	1.81	12	0	1.2	T	10.4	-	32	NW	15	8	9	14	6.1	60
Asheville	2093	945.5	1021.1	--	---	----	-- --	--	--	---	--	-		32	77	-----	---	-----	--	-		-	7.4	NNW	---	---	-				----	--
Charlotte	753	991.9	1019.4	54	36	44.5	+3.0	72	7	14	16	0	15	36	74	4.93	+1.07	2.35	9	0	.4	T	5.5	S	25	S	30	7	4	20	7.0	54
Greensboro	891	988.8	1021.7	51	31	40.6	+1.4	72	8	10	16	0	20	32	75	5.29	+1.46	2.70	11	0	.1	T	6.2	SW	26	NW	15	8	3	20	6.9	59
Hatteras	4	1020.3	1021.0	59	45	52.1	+2.0	73	7	27	16	0	2	17	82	2.81	-1.40	.87	12	0	.0	0	13.3	NNW	47	SW	15	9	6	16	6.3	47
Raleigh CO	406	---	---	57	37	46.9	+3.9	77	7	14	16	0	15	--	--	2.93	-.65	1.05	11	0	T	0	6.6	—	27	SW	9	7	8	16	6.7	45
Raleigh	438	1005.1	1021.2	57	34	45.4	- -	78	7	12	17	0	16	34	70	3.24	-----	1.26	11	0	T	0	7.6	SW	---	--	--	8	4	19	6.9	
Wilmington	30	1020.0	1021.6	63	41	51.7	+2.6	79	7	19	17	0	11	44	79	3.70	+.92	1.47	9	0	.0	0	8.5	SSW	38	SW	15	11	8	12	6.0	55
Winston-Salem	967	985.1	1021.3	51	33	41.5	+2.2	71	8	10	16	0	18	29	65	5.23	+1.49	1.61	13	0	3.6	T	10.2	SW	---	- -	--	8	6	17	6.5	--
NORTH DAKOTA																																
Bismarck	1653	953.6	1017.9	16	-4	5.9	-6.9	48	1	-36	18	0	31	1	80	.91	+.34	.20	13	0	11.4	10	9.0	NW	35	NW	10	6	4	21	7.2	45
Devils Lake CO	1471	960.0	------	12	-3	4.6	-4.9	44	1	-24	18	0	31	--	-	.25	-.29	.10	11	0	2.8	2	8.8	-	31	N	6	7	6	18	6.9	17
Fargo	895	979.0	1016.9	14	0	7.1	-4.4	42	3	-26	23	0	30	1	78	2.19	+1.47	.52	14	0	20.3	15	13.0	NNW	37	S	3	7	8	16	6.6	18
Williston CO	1877	946.5	1018.2	15	3	5.8	-8.0	49	1	-28	21	0	30	1	77	.55	-.03	.12	10	0	8.2	6	6.0	---	21	NW	10	4	7	20	7.7	43
OHIO																																
Akron	1210	979.0	1018.4	38	21	29.2	-1.6	63	7	-11	16	0	24	23	78	4.89	+2.38	.88	17	1	19.6	11	12.1	S	---	---	-	4	8	19	7.2	--
Cincinnati Obs.	761	------	------	44	27	35.5	+2.1	71	31	-4	16	0	19	-	-	6.03	+3.05	1.18	15	2	8.4	7	7.7	---	33	W	7	—	--	--	----	38
Cincinnati	871	985.4	1018.4	43	27	34.7	-----	69	6	-6	16	0	19	27	76	6.17	-----	1.15	15	1	8.6	7	12.0	S	---	---	--	5	6	20	7.5	-
Cleveland CO	663	------	------	40	26	32.7	+1.5	66	7	-5	16	0	19	-	--	3.89	+1.45	.70	16	-	----	-	----	---	---	---	--	--	--	--	----	--
Cleveland	787	988.5	1017.4	38	23	30.4	+1.3	63	6	-9	16	0	20	24	79	5.60	+3.16	.83	18	0	22.1	13	13.9	S	42	SW	21	5	7	19	7.3	33
Columbus CO	724	-- ---	---	40	26	32.9	+.5	65	31	-9	16	0	20	--	-	5.14	+2.41	1.10	14	1	12.8	10	----	---	---	---	--	--	--	--	---	--
Columbus	815	987.5	1018.6	41	23	31.8	+1.4	68	31	-14	16	0	23	26	78	5.07	+2.34	1.12	12	1	13.7	10	9.7	SE	38	W	18	7	4	20	7.3	42
Dayton	1002	981.0	1018.5	39	23	31.3	.0	67	31	-15	16	0	20	25	78	5.07	+2.32	.85	14	1	14.1	10	14.1	S	47	W	21	5	8	18	7.3	45
Sandusky	603	993.9	-----	39	24	31.1	-.1	66	3	-6	16	0	19	--	--	5.74	+3.46	1.05	16	1	20.2	11	10.1	---	34	SW	21	6	7	18	7.1	49
Toledo	621	993.6	1017.5	36	19	27.7	-1.4	64	3	-10	16	0	20	23	79	4.23	+1.88	.87	17	0	25.5	15	13.4	SW	47	SW	21	5	10	16	7.0	39
Youngstown	1178	974.3	1017.7	38	21	29.4	-.6	60	3	-9	17	0	24	23	77	4.36	-1.99	.78	19	1	14.5	10	12.3	W	*40	WSW	21	3	9	19	7.4	--
OKLAHOMA																																
Oklahoma City	1254	968.8	1016.4	54	28	41.2	+1.9	79	31	6	21	0	20	26	64	.07	-1.43	.07	1	0	T	T	16.9	S	47	NW	14	11	6	14	5.5	56
Tulsa	672	991.2	1016.1	52	28	39.8	+1.0	78	31	5	21	0	20	28	68	.38	-1.52	.19	6	0	1.1	1	13.3	S	33	SW	6	10	5	16	6.2	56
OREGON																																
Baker	3369	------	------	--	--	----	--- -	-	--	---	--	-	--	18	--	-----	-----	-----	--	-	----	--	6.5	SE	---	---	--	--	--	--	----	-
Baker CO	3446	894.7	1018.7	31	17	24.2	3.1	48	1	0	9	0	31	-		.79	-.91	.23	13	0	12.3	4	5.8	- -	42	SW	4	0	7	24	8.6	35
Burns CO	4140	871.0	1017.7	33	16	24.2	-2.1	48	1	-4	24	0	31	21	84	2.58	+1.21	.68	15	0	30.2	12	----	---	---	--	--	3	5	23	8.4	--
Eugene	364	1003.7	1017.7	44	32	38.0	-----	56	1	24	30	0	15	35	89	7.82	----	1.58	20	0	3.5	3	8.2	S	---	--	--	0	7	24	8.9	—
Meacham	4050	-----	------	30	18	24.3	-----	45	1	4	24	0	31	--	--	3.40	----	.84	19	0	38.1	26	---	---	---	---	--	0	6	25	9.2	--
Medford	1314	970.2	1018.9	41	31	35.9	-2.2	51	18	20	9	0	20	32	86	4.77	+1.89	1.25	15	0	.4	T	4.9	S	*35	SSE	4	2	3	26	9.0	--
Pendleton	1489	961.7	1017.1	37	24	30.5	-3.8	56	1	11	31	0	23	24	79	.82	-.80	.23	18	0	7.3	3	9.5	S	--	----	--	0	6	25	8.9	--
Portland CO	30	----	------	44	35	39.3	-1.9	53	1	26	31	0	10	--	-	6.64	-.08	1.28	17	0	.2	T	--	---	--	----	--	--	--	--	----	-
Portland	21	1010.8	1016.8	43	32	37.5	-2.3	51	21	22	25	0	16	33	85	5.06	-----	1.04	18	0	.7	1	6.7	SSW	57	S	4	1	4	26	9.0	28
Roseburg CO	479	999.3	1018.3	46	35	40.3	-1.5	54	1	27	9	0	8	-	--	8.87	+3.53	1.96	21	1	4.6	3	4.3	---	40	SW	1	0	5	26	9.1	14
Salem	195	1009.5	1017.0	43	32	37.6	-3.4	55	1	20	25	0	15	35	89	6.73	+.17	1.37	18	0	.2	T	8.6	S	---	---	--	1	4	26	8.9	--
Sexton Summit CO	3836	--	---	38	29	33.1	-----	60	11	19	7	0	25	--	--	8.11	-----	1.28	20	0	39.7	10	----	---	---	---	--	5	3	23	7.9	--
Troutdale	29	--	--- --	43	33	38.0	-----	51	2	21	31	0	14	--		5.92	- ---	1.10	19	0	1.3	1	----	---	---	- --	--	2	3	26	8.8	--
PENNSYLVANIA																																
Allentown	381	1005.4	1020.0	41	24	32.3	-.4	64	7	-2	20	0	23	25	75	5.23	+1.93	1.48	12	0	12.8	9	9.1	W	---	---	--	6	7	18	6.7	--
Curwensville	2215	----	------	35	19	26.7	-----	63	7	-13	17	0	24	21	78	5.94	-----	.90	25	1	36.9	19	12.9	W	35	W	18	3	5	23	8.1	--
Erie CO	655	------	------	40	28	34.0	+2.1	65	7	3	16	0	19	--	--	3.99	+1.16	.74	21	0	23.0	7	11.2	---	29	SW	21	2	3	26	8.6	17
Harrisburg	335	1005.8	1019.7	42	26	33.9	+1.2	69	7	0	17	0	22	24	69	4.75	+1.73	1.36	11	0	19.5	14	7.1	WNW	42	NW	15	7	10	14	6.5	44
Park Place	1932	------	- ---	36	22	29.0	-	63	7	-4	17	0	23	--	--	6.07	-----	2.70	18	0	18.4	14	----	---	---	---	--	5	6	20	7.2	--
Philadelphia CO	26	------	------	47	33	40.2	+3.9	72	7	10	17	0	15	-	-	4.87	+1.44	1.36	11	0	5.3	5	8.2	---	38	S	°20	6	12	13	6.3	56
Philadelphia	13	1015.2	1019.7	47	31	38.7	+4.1	72	7	8	17	0	19	28	69	5.48	+2.05	1.77	11	0	5.7	5	10.2	WNW	*40	SSE	20	8	11	12	6.7	--
Pittsburgh CO	749	----	---	45	28	36.4	+1.7	67	7	-7	16	0	20	-		3.40	+.54	1.04	17	-	10.6	--	----	---	---	---	--	---	--	--	----	23
Pittsburgh	1248	987.5	1018.7	43	26	34.6	+2.6	68	7	-5	16	0	19	25	70	3.83	+.97	1.11	19	1	13.1	5	12.9	S	43	W	15	6	5	20	7.4	38
Reading CO	266	1007.5	1019.6	44	30	36.6	+2.4	70	7	3	17	0	19		--	5.45	+1.89	1.50	11	0	13.3	10	11.2	--	47	W	15	6	8	17	7.0	38
Scranton CO	746	988.8	1019.0	39	26	32.5	+1.8	67	7	0	17	0	21	--	--	2.48	-.54	.75	17	0	13.8	11	7.1	---	29	NW	15	5	8	18	7.1	36
Williamsport	527	999.7	1019.0	39	21	30.0	-.8	63	7	-11	17	0	22	22	72	4.65	+1.79	1.52	17	0	17.6	16	8.1	E	*57	W	22	5	8	18	7.2	--
RHODE ISLAND																																
Block Island	356	1014.2	------	47	32	39.0	+3.0	59	5	16	16	0	18		-	5.35	+1.55	1.53	11	1	2.2	2	----	---	---	---	--	4	13	14	6.5	--
Providence CO	12	---	- -	45	28	36.2	+4.6	63	8	8	17	0	21	--	--	5.50	+2.12	1.72	13	1	5.1	4	----	---	---	---	-	---	--	--	--	-
Providence	55	1012.5	1018.6	43	26	34.5	+4.2	63	8	5	17	0	22	25	70	5.17	+1.79	1.79	13	1	4.7	3	9.2	WNW	38	NW	9	10	9	12	5.8	50
SOUTH CAROLINA																																
Charleston	9	1019.3	- -	63	47	55.1	+3.4	78	9	27	16	0	2	--		3.20	+.48	.81	8	0	.0	0	10.1	---	10	S	18	9	2	20	6.8	53
Charleston	41	1019.6	1021.6	65	43	54.3	+5.2	81	9	23	17	0	5	45	75	2.43	-.29	.56	9	0	.0	0	8.9	SW	---	---	--	7	5	19	6.7	-
Columbia CO	332	1008.5	--	60	41	50.6	+3.4	77	8	19	16	0	10	-	-	3.12	+.09	1.07	11	0	.0	0	8.0	--	29	SW	21	7	6	18	6.9	42
Columbia	217	1012.9	1021.4	61	38	49.4	----	78	8	16	°17	0	11	40	76	3.76	-----	1.11	13	0	.0	0	8.9	SW	- -	---	--	7	4	20	7.2	--

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
												No. of days							No. of days		Snow, Sleet, Hail				Fastest mile							
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	Max. 90° F or above	Min 32° F or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	.01 inch or more	With thunderstorms	Total	Max depth on ground	Average hourly speed	Prevailing direction	Speed	Direction	Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F	°F	°F	°F	°F		°F				°F	%	In.	In	In			In.	In	M p. h.		M p. h			0–3	4–7	8–10	0–10	%
SOUTH CAROLINA (Cont'd.)																																
Florence	146	1015.6	1018.4	62	40	50.8	----	79	8	17	17	0	10	40	72	3.02		0.98	11	0	.0	0	9.6	SW				7	4	20	7.3	--
Greenville	1006	982.7	1020.6	53	36	44.9	+2.7	70	4	15	16	0	12	35	73	7.71	+2.87	3.29	12	0	T	T	7.5	SSW	32	N	27	5	8	18	7.2	49
Spartanburg	801	990.5	1021.2	51	36	44.6	+2.0	70	7	14	16	0	14	36	76	6.93	+2.37	2.98	11	0	T	T	7.0	SW	*46	NW	15	5	5	21	7.5	
SOUTH DAKOTA																																
Huron	1282	966.8	1016.6	20	2	11.0	-7.7	50	2	-22	16	0	29	5	78	1.44	+.87	.78	11	0	16.0	8	12.0	NW	37	S	30	5	8	18	7.2	37
Rapid City	3215	897.1	1015.9	28	7	17.4	-7.7	66	1	-18	16	0	30	8	72	.53	+.09	.12	11	0	5.5	3	12.3	NNW	47	NW	11	6	7	18	6.7	38
Sioux Falls	1420	962.4	1016.5	24	4	14.0	-6.7	55	2	25	27	0	28	7	75	1.59	+.87	.45	16	0	17.3	12	11.1	WNW	*30	WNW	3	7	5	19	7.2	-
TENNESSEE																																
Bristol	1519	965.1	1019.0	52	29	40.5	-.1	78	7	6	16	0	22	31	71	4.19	+.23	1.25	10	0	.8	T	7.3	WSW	*30	WNW	15	10	4	17	6.2	--
Chattanooga	670	992.2	1020.6	55	34	44.3	+3.4	78	7	11	16	0	15	34	73	8.89	+3.76	2.66	11	0	T	0	7.9	SSW	42	N	14	6	10	15	6.8	43
Knoxville	949	984.8	1020.7	54	33	43.5	+4.5	77	7	9	16	0	17	35	74	5.43	+.91	1.77	9	0	T	T	8.6	NE	52	SW	14	7	11	13	6.4	41
Memphis CO	271	- -	------	54	38	46.1	+2.5	76	31	15	16	0	11			7.44	+2.93	1.86	12	-	T	T	- -	-				--	--	- -	-
Memphis	263	1003.7	1018.7	55	37	45.9	+3.5	79	31	11	16	0	12	37	72	6.86	+1.36	1.76	12	2	T	T	13.9	S	38	S	6	9	4	18	6.6	41
Nashville	577	999.7	1019.5	51	34	43.8	+2.8	76	31	9	16	0	16	35	71	10.60	+6.40	3.88	12	2	.5	T	8.6	S	40	NW	7	8	7	16	6.7	48
TEXAS																																
Abilene	1752	954.3	1016.1	63	35	48.8	+3.7	85	31	12	21	0	14	27	49	.11	-1.23	.11	1	0	T	T	15.6	SSW	43	S	19	10	6	15	5.8	61
Amarillo	3590	888.2	1014.3	53	24	38.4	+2.9	76	1	5	20	0	22	14	56	.45	-.35	.43	3	0	4.5	1	14.1	SW	47	W	5	15	6	10	4.5	62
Austin	515	995.9	1018.0	66	42	54.0	+3.0	83	31	18	16	0	6	41	68	.34	-2.32	.21	6	1	.0	0	9.4	S	42	N	11	8	6	17	6.2	50
Big Spring	2533	926.5	1016.8	62	35	48.3	+4.5	85	30	15	21	0	15	24	45	.20	-.61	.20	1	0	.0	0	15.5	S	-			11	6	14	5.6	-
Brownsville	16	1014.2	1016.6	75	57	66.6	+4.8	88	5	40	22	0	0	56	78	.08	-1.79	.04	1	0	.0	0	13.0	SSE	36	S	6	8	8	15	6.2	69
Corpus Christi	40	1016.6	1017.6	72	52	62.2	+5.7	87	6	34	16	0	0	55	80	.09	-1.36	.06	3	1	.0	0	13.0	SSE	36	N	20	11	5	15	6.0	41
Dallas	487	999.0	1017.2	62	38	50.0	+2.3	87	30	16	21	0	13	37	64	.25	-2.11	.09	4	1	.0	0	11.2	S	47	S	31	12	5	14	5.3	61
Del Rio	957	983.4	1018.3	68	42	55.1	+2.9	88	5	23	16	0	4	38	60	.42	-.27	.35	3	1	.0	0	7.2	E	31	N	14	13	6	12	5.3	70
El Paso	3920	881.8	1015.8	58	35	46.4	+2.7	74	30	25	22	0	13	30	55	.68	+.16	.52	6	0	7.1	5	11.1	N	66	W	4	15	7	9	4.6	73
Fort Worth	688	992.6	1017.2	63	38	50.1	+3.6	90	30	16	21	1	12	33	59	.09	-1.78	.07	2	0	.0	0	15.1	S	*36	NW	11	13	4	14	5.1	--
Galveston CO	7		------	66	53	59.5	+3.1	75	20	33	21	0	0	--	--	2.48	-1.27	1.28	5	0	.0	0	14.9	--	40	N	21		--	---	----	34
Galveston	7	1017.6	1018.2	66	52	58.9	+2.5	74	8	33	21	0	0	54	86	2.58	-1.17	1.78	4	1	.0	0	14.0	SSE	--			5	8	18	7.4	--
Houston CO	41	1012.9	-- -	68	50	59.0	+4.6	82	5	28	16	0	3			1.32	-2.91	.51	8	2	.0	0	11.5		38	N	14	5	11	15	7.0	36
Houston	41	1015.2	1018.2	69	48	58.1	+4.3	81	6	28	16	0	4	51	79	2.53	-2.36	.77	8	1	T	T	15.2	S			--	5	7	19	7.3	
Laredo	500	1001.4	1016.5	74	51	62.7	+6.1	95	6	32	16	1	1	44	60	.05	-1.26	.05	1	1	T	0	10.9	SSE				12	5	14	5.3	
Lubbock	3238	901.8	1015.1	58	27	42.3	+1.5	77	2	8	21	0	22	21	49	.02	-.77	.02	1	0	T	T	15.7	WSW	*56	W	5	9	7	15	6.0	
Palestine CO	491	999.3	---	63	42	52.9	+3.0	81	31	19	21	0	7			1.42	-2.25	.71	9	2	.0	0	9.7	--	30	S	31	8	9	11	6.1	53
Port Arthur CO	5	1016.3	- -	66	50	58.0	+3.3	78	20	30	16	0	3	--	--	4.55	-.68	1.55	9	3	.0	0	14.5	--	36	N	20	8	7	16	6.4	47
Port Arthur	5	1016.9	1018.4	68	47	57.3	---	80	7	24	16	0	4	51	88	4.95	---	1.81	11	3	.0	0	12.5	S	-		-	8	8	15	6.7	--
San Angelo	1903	948.9	1016.7	65	37	51.1	+4.2	87	30	16	21	0	11	29	50	.31	-.91	.31	1	0	.0	0	11.6	SW	*38	W	20	11	9	11	5.2	--
San Antonio	782	992.9	1017.5	68	43	55.2	+1.5	85	20	20	16	0	5	41	65	.13	-1.48	.07	3	0	.0	0	8.3	N	40	NE	11	8	9	14	6.0	50
Victoria	109	1012.9	1017.4	70	49	59.4	+2.9	84	20	27	16	0	4	50	77	.48	-2.24	.20	5	0	.0	0	10.4	SSE	*54	N	20	8	6	17	6.8	-
Waco	504	998.6	1017.4	64	39	51.4	+1.5	83	31	17	16	0	11	39	68	.44	-2.37	.24	4	3	.0	0	13.7	S	- -	--	--	11	3	17	5.6	
Wichita Falls	1027	978.7	1016.2	61	32	46.1	+1.1	86	30	10	21	0	18	26	51	.07	-1.47	.07	1	1	T	0	12.4	N	*38	WNW	14	14	6	11	4.8	
UTAH																																
Milford	5028	843.2	1020.7	34	11	22.7	5.1	48	1	13	16	0	30	18	79	1.31	+.53	.47	7	1	10.3	5	7.9	S	*30	SSW	30	10	7	14	6.2	--
Salt Lake City	4222	866.2	1018.8	34	18	26.1	-4.1	55	1	3	8	0	29	21	81	2.90	+1.50	.54	18	1	26.0	8	7.7	SSE	40	NW	2	5	7	19	7.3	35
VERMONT																																
Burlington	331	1001.7	1017.3	33	17	25.0	+.6	60	[illegible]	-14	17	0	26	19	75	2.19	+.31	.57	16	0	24.7	14	11.9	W	43	S	7	5	3	23	7.8	19
VIRGINIA																																
Cape Henry CO	16	1002.7	1020.3	55	40	47.3	+3.6	77	8	20	17	0	7	-	--	2.99	-.45	1.15	10	0	.0	0	12.7	---	40	NW	19	9	8	14	5.8	56
Lynchburg	947	986.5	1020.8	48	30	39.3	+2.0	70	8	8	16	0	22	28	68	4.82	+1.56	1.98	11	0	3.6	2	8.2	SSW	25	SW	9	8	8	15	6.4	44
Norfolk CO	11	1017.3	1020.9	57	40	48.2	+5.1	78	7	21	16	0	10		-	2.67	-.67	.93	9	0	T	0	9.7	---	37	S	20		-	--	----	46
Norfolk	25	1019.6	1020.9	56	36	46.1	+4.8	77	[illegible]	17	17	0	16	36	71	2.80	-.54	.93	10	0	T	0	9.6	SW			-	8	6	17	6.5	--
Richmond CO	162	- -	-----	53	34	43.1	+3.3	77	9	13	17	0	17	-		3.72	+.43	1.66	8		.2	T	----	---	--	- -	-	-	--	--	----	--
Richmond	160	1014.6	1020.8	52	32	42.0	+4.2	76	9	10	17	0	20	32	73	3.63		1.56	9	0	T	T	7.3	SW	33	S	20	7	6	18	6.8	42
Roanoke	1192	977.3	1020.8	48	29	38.4	-1.5	73	7	5	17	0	24	27	67	3.83	+.73	1.26	8	0	5.2	2	9.1	SE				8	7	16	6.2	
Washington CO	72	-----	------	48	33	40.7	+4.1	74	7	10	17	0	18	- -	---	4.77	+1.45	1.76	12	-	4.3	3	7.6		33	NW	°15	-			----	--
Wash. Nat'l. AP	14	1016.6	1020.7	48	33	40.9	+4.3	73	7	13	16	0	17	29	66	4.54	+1.22	1.85	12	0	4.8	3	10.2	SSW	52	NW	15	8	7	16	6.6	43
WASHINGTON																																
Ellensburg	1727	952.3	1017.0	32	14	23.2	5.4	49	1	6	24	0	31	20	88	.95	-.54	.29	12	0	16.2	7	6.3	E	-	-	-	2	10	19	7.6	--
Kelso	17	------	-----	43	32	37.3	----	52	1	18	31	0	14	-	--	7.42		1.23	19	0	1.1	T	-	- -	-			3	3	25	8.6	-
North Head CO	194	1006.8	1014.6	45	38	41.4	-2.7	51	1	27	31	0	4			6.09	-3.39	1.28	20	0	1.7	1	16.5	---	73	S	17	3	10	18	7.6	31
Olympia	190	1007.1	1015.4	42	30	36.2	- -	50	1	12	31	0	18	33	88	5.80		1.34	18	0	1.3	1	5.5	SSW	-	--	--	3	4	24	8.2	-
Port Angeles	11	1013.2	1014.9	44	36	40.1	----	52	17	24	31	0	6	34	79	2.51	-	.46	19	0	.8	T	10.9	WSW	- -	- -	.	3	5	23	8.2	-
Seattle	14	1014.2	1015.4	-		---	----	--	--	--	-	-	--	33	81	--					---	-	9.2	SSE	--						.	
Seattle CO	14	-----	------	44	36	39.9	2.7	50	1	23	31	0	7			4.15	-1.45	1.12	17	1	1.9	1	10.3	--	45	S	18	5	2	24	8.1	23
Spokane	2357	945.1	1016.7	28	17	22.2	8.3	48	1	9	31	0	31	18	84	4.35	+2.16	1.60	20	0	39.4	25	6.2	SSW	35	SW	1	2	2	27	9.0	12
Stampede Pass CO	3960	874.0	1015.5	27	19	23.0	-- -	39	11	7	25	0	31		--	15.51		3.50	24	0	145.9	103	10.4	--	56	W	21	2	3	26	8.8	--
Stevenson CO	319	-	------	40	32	35.8	--	50	21	22	25	0	16	--	--	10.90	--	2.28	20	1	12.3	7	---	--	--	- -	--	2	1	28	9.2	--
Tacoma CO	127	1007.8	1014.9	43	34	38.3	-2.3	50	1	21	31	0	9	--	-	2.20	-4.51	.61	15	0	.8	T	7.9	--	39	SW	18	1	7	20	7.6	28
Tatoosh CO	101	1010.5	1013.6	44	37	40.5	-3.4	50	1	26	31	0	5	36	84	8.77	-4.59	1.91	22	2	2.7	1	17.6	E	69	E	4	2	3	26	8.6	23
Walla Walla	1200	-----	-----	-	-	----	----	--	--	---	--		-	25					--	-	----	--	8.1	S	- -	--	--	- -	--	--	---	--
Walla Walla CO	949	980.0	1017.3	37	25	31.2	-4.3	61	1	9	31	0	23		--	1.26	-.80	.26	15	0	11.5	5	5.9	-	34	SW	4	1	5	25	8.8	16
Yakima	1061	976.6	1017.0	34	18	26.3	-5.9	55	1	2	30	0	31	21	81	.85	-.07	.40	8	0	4.9	3	5.7	W	-	--		3	7	21	7.9	--
Seattle-Tacoma AP	379	1000.7	1015.4	42	31	36.4	-----	49	1	16	31	0	19	33	86	3.92	---	.85	19	0	3.3	1	11.6	SSW	-	---	--	3	6	22	8.2	--
WEST VIRGINIA																																
Charleston	950	983.1	1019.4	52	30	40.6	-----	79	31	2	16	0	21	29	67	5.73	--	1.78	15	1	1.9	1	9.5	SSW	*35	W	18	8	3	20	7.1	-
Elkins	1969	948.5	1020.1	47	22	34.4	+2.7	76	7	-5	17	0	23	26	74	4.29	+.83	.94	18	0	10.6	3	6.9	WNW	43	W	15	6	5	20	7.4	36
Huntington	565	------	------	52	30	40.9	+7.4	80	31	2	16	0	20	-	--	6.08	+2.48	1.41	15	-	6.0	2	---	---	—	--	—	--	—	—	——	—
Parkersburg CO	615	------	-----	48	28	37.9	+2.7	75	31	-1	16	0	22	-	-	4.69	+1.66	1.04	15	1	4.0	3	6.8	--	30	NW	18	8	3	20	7.5	30
Parkersburg	837	------	1017.6	--	--	----	--- -	--	--	--	--	-	-	28					--	-	----	--	10.8	WSW					-	-		
Petersburg	1013	--- ---	------	47	25	36.0	-----	76	7	-7	17	0	23	-	--	2.93	---	.87	12	0	11.7	5	-	-				11	4	16	6.2	--
WISCONSIN																																
Green Bay	689	991.9	1015.5	27	10	18.5	-3.8	53	3	-17	24	0	27	13	79	1.09	-.62	.37	14	1	10.0	8	11.6	W	42	SW	7	7	6	18	7.0	38
La Crosse	669	989.8	1015.8	27	10	18.9	-1.5	60	3	18	24	0	26	13	75	.80	-.53	.22	13	0	11.2	9	10.8	NW	*38	SSW	7	6	7	18	7.2	--
Madison	857	983.4	1016.3	29	11	20.3	-2.1	60	3	-19	24	0	26	13	75	1.47	-.16	.39	13	1	15.1	13	11.8	W	40	SW	7	6	7	18	7.3	37
Milwaukee	674	989.2	1015.6	32	16	23.8	-.9	58	3	10	16	0	23	16	75	2.26	+.54	.58	13	1	26.5	17	12.8	WNW	50	S	6	6	6	19	7.1	38
WYOMING																																
Casper	5322	830.3	1013.4	32	9	20.4	-7.9	51	1	17	20	0	30	11	64	.42	-.31	.25	6	0	12.9	6	14.3	SW			--	8	9	14	6.0	--
Cheyenne	6139	803.9	1013.2	36	13	24.4	-4.1	59	1	16	20	0	31	12	60	.93	+.38	.57	9	0	8.3	4	15.8	W	49	W	22	12	6	13	5.8	54
Lander	5563	829.0	1015.2	32	8	19.9	-.5	53	1	17	20	0	31	8	62	.27	-.41	.12	5	0	7.1	3	7.0		43	SW	28	12	8	11	5.1	55
Rock Springs	6741	788.4	1017.7	28	11	19.2	-3.5	41	1	-10	9	0	31	12	72	.42	+.02	.14	9	0	8.0	2	14.9	WSW	*44	W	10	7	8	16	6.7	-
Sheridan	3942	879.8	1016.5	29	7	18.1	-4.7	56	1	19	20	0	31	9	71	.68	+.04	.16	15	0	10.4	4	9.0	NW	59	W	28	3	8	20	7.4	47

See footnotes at end of table.

Table 2—Continued

State and station	Elevation (ground)	Pressure		Temperature												Precipitation							Wind					No. of days (sunrise to sunset)			Sky cover, tenths (sunrise to sunset)	Possible sunshine
		Station	Sea level	Average maximum	Average minimum	Average	Departure from normal	Highest	Date	Lowest	Date	No. of days: # Max. 90° F. or above	No. of days: Min. 32° F. or below	Average dew point	Average relative humidity	Total	Departure from normal	Greatest in 24 hours	No. of days: .01 inch or more	No. of days: With thunderstorms	Snow, Sleet, Hail: Total	Snow, Sleet, Hail: Max. depth on ground	Average hourly speed	Prevailing direction	Fastest mile: Speed	Fastest mile: Direction	Fastest mile: Date	Clear	Partly cloudy	Cloudy		
	Ft.	Mb.	Mb.	°F	°F	°F.	°F.	°F.		°F.				°F.	%	In.	In.	In.			In.	In.	M. p. h.		M. p. h.			0–3	4–7	8–10	0–10	%
PACIFIC AREA																																
Canton Island	9	1008.1	1008.5	88	79	83.6	-----	95	6	73	25	11	0	74	77	3.88	-----	1.81	7	0	.0	0	----	---	---	---	--	3	15	13	6.9	--
Hilo	28	1014.6	1016.0	78	64	70.9	-----	85	14	60	24	0	0	64	83	20.97	-----	6.12	24	1	.0	0	5.7	SW	22	SE	16	3	6	22	7.6	30
Honolulu CO	12	- ----	------	78	70	73.8	+1.4	80	5	66	10	0	0	-	--	4.85	+.89	2.35	16	0	.0	0	----	---	---	---	--	--	--	--	-----	--
Honolulu	7	1015.9	1016.3	79	69	74.1	-- ---	82	14	66	28	0	0	65	75	5.30	--- --	2.68	10	1	.0	0	11.0	ENE	37	E	31	7	10	14	6.6	46
Lihue	115	1010.5	1015.8	78	68	73.0	-- ---	80	1	64	28	0	0	66	80	12.59	- --	4.65	19	2	.0	0	11.8	ENE	34	S	17	4	8	19	7.4	38
Wake Island	9	1014.2	1014.6	83	76	79.4	--	86	7	72	27	0	0	70	75	1.75	-----	.58	16	0	.0	0	15.1	E	---	---	--	11	12	8	5.2	--
Koror	117	1004.7	1008.2	88	75	81.6	-----	90	19	72	11	5	0	--	--	13.98	-----	3.56	26	2	.0	0	----	---	---	---	--	-	--	--	----	--
Moen Island, Truk Group	3	1009.8	1010.2	87	77	81.5	- --	89	12	74	2	0	0	--	--	8.54	-----	3.26	18	0	.0	0	----	---	---	---	--	--	--	--	----	--
Yap Island	51	1007.5	1010.0	86	76	81.1	--- --	93	7	71	23	4	0	--	--	12.45	-----	3.65	28	4	.0	0	----	---	---	---	--	0	14	17	7.6	--
Ponape (October)	109	1006.4	1011.5	88	73	80.5	-----	92	27	70	20	6	0	--	--	12.56	-----	2.80	22	0	.0	0	----	---	---	---	--	--	--	--	----	--
Koror (November)	117	1004.1	1007.8	88	76	81.9	- ---	91	8	74	26	9	0	--	--	10.74	-----	1.84	22	2	.0	0	----	---	---	---	--	--	--	--	----	--
Ponape (November)	109	1005.1	1010.3	89	75	81.6	--- --	92	6	72	10	10	0	--	--	12.00	- --	2.87	26	0	.0	0	----	---	---	---	--	--	--	--	----	--
PUERTO RICO																																
San Juan CO	47	---- --	------	82	72	76.9	+.6	85	13	69	°26	0	0	--	--	10.21	+4.71	3.84	22	1	.0	0	----	---	---	---	--	--	--	--	----	--
San Juan	9	1016.4	1016.4	83	71	76.9	-- --	86	19	69	°10	0	0	70	79	10.80	- --	3.88	24	1	.0	0	7.4	ESE	29	E	6	8	16	7	5.3	61
CORRECTIONS:																																
ALASKA																																
October 1951																																
Anchorage	134	1006.8	1011.9	40	24	31.6	-4.4	53	1	12	22	0	28	26	78	0.88	-0.99	0.47	10	0	3.6	1	5.9	N	38	S	3	9	5	17	6.5	42
Annette Island	110	1008.5	1012.7	49	39	44.1	-2.6	58	7	33	24	0	0	37	77	9.44	-5.98	2.27	20	0	T	T	12.4	NE	47	SE	7	1	5	25	8.9	--
Barrow	22	1013.9	1014.5	28	17	22.6	+5.7	35	18	-5	29	0	31	20	87	.79	+.24	.25	10	0	8.8	9	13.7	ESE	29	NE	7	2	4	25	8.8	--
Bethel	21	1007.5	1008.9	38	24	30.8	-.8	51	16	11	13	0	28	26	84	1.83	+.08	.65	9	0	6.5	2	9.5	NE	26	SE	2	8	7	16	6.5	--
Cordova	40	1008.5	1010.2	46	27	36.5	-3.8	52	2	15	18	0	23	30	82	9.81	-2.85	1.89	13	0	T	0	2.9	ENE	---	---	--	8	4	19	7.0	--
Fairbanks	436	997.3	1015.1	32	12	22.3	-5.0	41	2	-6	29	0	31	14	75	.46	-.51	.20	5	0	6.4	4	4.2	N	25	ENE	19	7	5	19	7.0	-
Galena	120	1008.1	1013.2	30	14	22.0	-4.4	41	1	-2	22	0	31	17	89	.28	-.30	.21	6	0	6.8	2	8.1	E	34	E	29	10	6	15	6.0	--
Gambell	25	1008.8	1009.6	35	30	32.5	+1.0	43	17	22	27	0	23	29	85	1.71	+.31	.52	16	0	12.0	9	22.2	NE	---	---	--	2	4	25	8.6	--
Juneau	15	1012.5	1013.7	44	32	38.0	-3.3	56	7	19	31	0	15	31	78	3.65	-4.67	1.54	14	0	T	T	5.6	E	43	SE	7	4	5	22	8.1	21
Kotzebue	10	1012.9	1013.5	29	19	24.0	-.9	38	1	1	28	0	31	19	79	.81	+.24	.45	10	0	8.8	6	15.9	E	45	E	29	13	6	12	5.1	--
McGrath	334	999.7	1012.8	33	16	24.4	-3.2	45	25	0	23	0	30	18	77	.62	-1.12	.27	7	0	3.3	2	3.6	N	36	SSW	3	10	5	16	6.2	--
Nome	13	1010.5	1011.1	36	23	29.6	+.2	46	18	10	12	0	30	23	78	.77	-.81	.53	7	0	2.8	1	10.7	NE	43	NE	28	14	3	14	5.3	46
Northway	1713	951.9	1016.8	27	7	16.6	-8.2	46	1	-12	19	0	30	10	77	.02	-.49	.01	2	0	.2	T	2.5	NW	---	---	--	8	7	16	6.2	--
St. Paul Island	22	1003.4	1004.4	43	35	39.1	+.1	47	17	27	°2	0	9	36	86	3.66	+.34	.52	20	0	.2	T	----	---	---	---	--	0	12	19	8.1	--
Umiat	337	1004.4	1018.0	19	2	10.8	-1.6	40	1	-17	11	0	31	8	85	.56	+.05	.27	10	0	5.6	6	5.0	WSW	---	---	--	8	5	18	6.9	--
Wales	9	1011.2	1011.9	34	24	29.2	-1.4	47	16	14	10	0	28	--	--	.51	-.63	.13	8	0	1.9	2	----	---	---	---	--	5	11	15	6.6	--
Yakutat	28	1010.5	1011.8	48	32	39.8	-1.8	55	10	19	30	0	15	32	77	7.74	-11.57	4.24	13	0	T	T	5.6	E	36	E	18	6	4	21	7.5	--
November 1951																																
Anchorage	134	998.0	1003.3	29	17	22.7	+.4	53	1	-6	18	0	28	20	88	.27	-.73	.10	9	0	3.3	1	3.5	N	26	SE	1	5	6	19	7.8	23
Annette Island	110	1001.7	1005.8	44	36	40.2	+.3	58	5	26	22	0	8	35	80	8.56	-1.96	1.22	21	0	3.9	1	15.4	ESE	45	SE	17	3	3	24	8.4	--
Barrow	22	1008.5	1007.7	18	5	11.3	+10.9	33	4	-16	30	0	30	7	80	.46	.18	.10	12	0	7.0	14	14.6	E	50	E	26	1	3	26	8.7	--
Bethel	21	1002.0	1003.3	28	15	21.4	+4.6	40	2	-13	30	0	30	21	92	1.50	+.53	.39	15	0	10.0	4	7.7	N	20	SSE	15	5	4	21	7.8	--
Cordova	40	999.0	1000.7	39	24	31.3	+1.9	48	4	4	18	0	22	28	88	13.00	+4.91	4.48	16	0	.2	T	2.9	E	---	---	--	4	3	23	8.2	--
Fairbanks	436	988.2	1006.1	19	4	11.6	+9.2	47	2	-21	18	0	30	7	76	.68	-.02	.13	15	0	14.7	13	2.1	N	13	N	10	0	5	25	8.9	--
Galena	120	999.3	1004.5	20	4	12.1	+10.0	38	2	-29	29	0	30	11	88	.87	+.33	.33	15	0	12.2	11	5.3	N	30	ESE	1	2	2	26	8.8	--
Gambell	25	1002.7	1002.1	30	22	25.9	+3.0	38	9	8	27	0	30	22	85	1.89	+.84	.40	18	0	18.2	5	20.7	NE	---	---	--	1	3	26	8.9	--
Juneau	15	1005.1	1005.0	36	26	31.1	-.9	46	4	4	20	0	20	28	88	4.70	-.70	.93	15	0	17.5	10	5.3	ESE	35	ESE	25	4	1	25	8.4	18
Kotzebue	10	1004.4	1004.9	20	7	13.2	+7.0	34	1	-23	30	0	30	10	81	.92	+.52	.17	15	0	17.1	17	15.8	E	58	E	19	3	5	22	8.1	--
McGrath	334	991.5	1004.6	23	11	16.7	+13.5	39	2	-24	30	0	30	15	87	1.12	+.04	.54	15	0	16.4	13	2.8	N	29	S	15	0	4	26	9.2	--
Nome	13	1002.4	1003.0	27	17	21.8	+5.9	37	2	-8	25	0	28	19	85	1.53	+.56	.38	15	0	18.8	11	10.4	ENE	39	E	19	7	3	20	7.2	27
Northway	1713	943.1	1008.9	8	-8	-.2	+3.3	28	4	-38	16	0	30	-5	76	.38	+.04	.26	6	0	6.2	7	1.2	SE	---	---	--	3	2	25	8.5	--
St. Paul Island	22	1001.0	1002.0	39	30	34.4	+1.9	43	2	15	24	0	17	31	84	3.19	+.36	1.20	24	1	2.0	2	----	---	---	---	--	0	9	21	8.3	--
Umiat	337	996.6	1010.2	13	-6	3.8	+8.2	27	2	-31	30	0	30	1	83	.30	-.20	.12	9	0	3.0	9	6.5	W	---	---	--	2	5	22	8.7	--
Wales	9	1003.1	1003.7	29	19	24.0	+5.6	38	1	-3	25	0	29	--	--	.83	+.32	.14	16	0	7.4	6	-- --	---	---	---	--	2	5	22	8.6	--
Yakutat	28	1001.0	1002.1	39	26	32.6	+.2	47	6	-3	19	0	17	29	87	10.32	-5.08	1.51	15	0	13.9	14	7.7	ESE	43	ESE	6	2	6	22	8.4	--

Data from airport unless otherwise specified. CO indicates data from city office.
* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.
° Other dates also.
Number of days Max., 70°F or above for Alaskan Stations.

HEATING DEGREE DAYS

Table 3 (Base 65°F.) DECEMBER 1951

State and station	Current season: This month	Current season: Period July through this month	Long term mean July through this month
ALABAMA			
Birmingham	484	1085	1014
Mobile (CO)	264	633	611
Mobile	288	672	
Montgomery (CO)	365	823	827
Montgomery	392	880	838
ARIZONA			
Flagstaff	1181	2961	2367
Payson (CO)	806	1598	
Phoenix (CO)	378	526	564
Phoenix	394	591	
Prescott	894	1815	
Tucson	413	618	
Winslow	930	1881	
Yuma	236	360	428
ARKANSAS			
Ft. Smith	712	1423	1252
Little Rock	625	1322	1176
Texarkana	513	1041	
CALIFORNIA			
Bakersfield	558	849	842
Beaumont (CO)	617	1075	
Bishop	934	1812	1703
Blue Canyon	995	2216	
Burbank	406	734	
Eureka (CO)	565	2107	2097
Fresno	620	987	954
Los Angeles (CO)	324	452	434
Los Angeles	334	498	
Mt. Shasta (CO)	1038	2364	
Oakland	511	1161	1197
Red Bluff	615	1049	1046
Sacramento (CO)	587	1080	1030
Sacramento	620	1060	
Sandberg (CO)	858	1694	
San Diego	285	408	502
San Francisco (CO)	460	1508	1323
San Francisco	504	1378	1353
San Jose	484	901	
Santa Catalina	421	878	
Santa Maria	490	1136	
COLORADO			
Alamosa	1426	3656	
Colorado Springs	1086	2703	
Denver	1108	2588	2249
Grand Junction	1293	2572	2280
Pueblo	1034	2458	2232
CONNECTICUT			
Bridgeport	894	1938	
Hartford	1005	2217	2233
New Haven	915	2032	2112
DELAWARE			
Wilmington	842	1802	
DIST. OF COLUMBIA			
Washington (CO)	746	1554	1698
Washington	742	1525	
FLORIDA			
Apalachicola	217	482	463
Daytona Beach	86	219	
Fort Myers	34	101	99
Jacksonville (CO)	169	408	445
Jacksonville	199	452	
Key West (CO)	0	7	12
Key West	1	11	
Melbourne	35	113	
Miami (CO)	10	42	54
Int. Airport, Hialeah	13	39	
Miami Beach	1	18	
Orlando	78	205	
Pensacola (CO)	250	579	549
Tallahassee	225	510	
Tampa	60	163	207
West Palm Beach	20	52	
GEORGIA			
Albany	319	686	662
Atlanta (CO)	518	1179	1168
Atlanta	549	1143	
Athens	569	1203	
Augusta	470	953	917
Columbus	419	897	
Macon	413	843	942
Rome	615	1294	
Savannah	303	668	636
Valdosta	255	573	
IDAHO			
Boise	1156	2534	2289
Lewiston	1084	2440	
Pocatello	1301	3011	2664
ILLINOIS			
Cairo (CO)	743	1604	1513
Chicago (CO)	1106	2419	2268
Chicago	1196	2613	
Chicago University	1141	2516	
Joliet	1268	2800	
Moline	1283	2735	
Peoria	1198	2598	2284
Springfield (CO)	1064	2244	2058
Springfield	1112	2398	
INDIANA			
Evansville	854	1908	1681
Ft. Wayne	1159	2574	2335
Indianapolis (CO)	995	2117	2060
INDIANA (Cont'd.)			
Indianapolis	1060	2329	
South Bend	1195	2725	
Terre Haute	1036	2289	
IOWA			
Burlington	1258	2638	2228
Charles City (CO)	1446	3259	2944
Davenport (CO)	1237	2607	2343
Des Moines	1372	2908	2435
Dubuque	1409	3205	2637
Keokuk (CO)	1157	2361	2135
Sioux City	1462	3167	2674
KANSAS			
Concordia (CO)	1139	2396	2065
Dodge City	1013	2248	1971
Goodland	1212	2733	2205
Topeka (CO)	1085	2250	1942
Topeka	1094	2302	
Wichita	964	2074	1774
KENTUCKY			
Lexington	841	1913	1819
Louisville (CO)	808	1752	1688
Louisville	824	1858	
Pikeville (CO)	707	1572	
LOUISIANA			
Baton Rouge	267	625	606
Lake Charles	251	547	
New Orleans (CO)	199	466	475
Int. Airport, Moisant	222	504	
Shreveport	432	871	856
MAINE			
Caribou	1570	3806	
Eastport	1155	2816	3120
Greenville (CO)	1486	3653	3616
Portland	1219	2816	2700
MARYLAND			
Baltimore (CO)	734	1529	1624
Baltimore	820	1753	
Frederick	901	1875	
MASSACHUSETTS			
Boston	923	1965	2113
Milton	1021	2338	
Nantucket	840	1798	1918
Pittsfield	1177	2966	
MICHIGAN			
Alpena (CO)	1243	3203	3000
Detroit	1126	2491	2422
Escanaba (CO)	1369	3510	3207
Grand Rapids (CO)	1126	2614	2478
Grand Rapids	1197	2845	
Lansing	1215	2877	2665
Marquette (CO)	1349	3593	3241
Muskegon	1152	2843	
Sault Ste. Marie	1448	3850	3430
Ypsilanti	1167	2599	
MINNESOTA			
Duluth (CO)	1636	4306	3658
Duluth	1675	4366	
International Falls	1847	4660	
Minneapolis	1500	3148	3034
Rochester	1513	3512	
St. Cloud	1649	3911	3441
St. Paul	1482	3407	3034
MISSISSIPPI			
Jackson	394	877	881
Meridian	406	927	899
Vicksburg	369	808	817
MISSOURI			
Columbia	1047	2186	1925
Kansas City	1056	2156	1875
St. Joseph	1177	2435	2035
St. Louis (CO)	924	1938	1723
St. Louis	965	2035	
Springfield	930	2057	1741
MONTANA			
Billings	1413	3333	
Butte	1591	4408	
Glasgow (CO)	1770	4011	
Great Falls	1538	3690	
Havre (CO)	1699	3907	3333
Helena	1563	3872	3192
Kalispell	1513	3842	3339
Miles City	1692	3776	
Missoula	1408	3549	3170
NEBRASKA			
Grand Island	1340	2901	
Lincoln (CO)	1307	2666	2292
Lincoln	1330	2805	
Norfolk	1453	3139	
North Platte	1348	3014	2501
Omaha	1385	2815	2372
Scottsbluff	1292	3150	
Valentine (CO)	1512	3317	2796
NEVADA			
Elko	1406	3211	
Ely	1439	3368	
Las Vegas	700	1199	
Reno	1062	2506	2249
Tonopah	1163	2410	
Winnemucca	1193	2756	2610
NEW HAMPSHIRE			
Concord	1246	2887	2789
NEW JERSEY			
Atlantic City	734	1511	1702
Newark	855	1822	1982
Trenton	828	1791	1856
NEW MEXICO			
Albuquerque	888	1771	1767
Clayton	943	2182	1927
Raton	1060	2643	
Roswell	711	1513	1510
NEW YORK			
Albany	1169	2808	2457
Bear Mountain (CO)	1053	2195	
Binghamton	1166	2858	2551
Buffalo	1062	2511	2458
New York (CO)	798	1694	1861
La Guardia Field	798	1648	
Oswego	1046	2465	2553
Rochester	1078	2543	2452
Schenectady (CO)	1134	2608	
Syracuse	1068	2519	2521
NORTH CAROLINA			
Asheville (CO)	736	1657	1622
Asheville	758	1679	
Charlotte	632	1245	1251
Greensboro	719	1532	1533
Hatteras	395	713	818
Raleigh (CO)	562	1189	1272
Raleigh	600	1290	
Wilmington (CO)	419	853	907
Winston-Salem	723	1489	
NORTH DAKOTA			
Bismarck	1832	4169	3496
Devils Lake (CO)	1874	4521	3959
Fargo	1798	4373	3623
Grand Forks			3870
Williston (CO)	1833	4222	3643
OHIO			
Akron	1106	2561	2330
Cincinnati (CO)	846	1802	1875
Cincinnati	933	2068	
Cleveland (CO)	996	2154	2197
Cleveland	1065	2325	
Columbus	1024	2266	2060
Dayton	1043	2254	2074
Sandusky (CO)	1041	2217	2202
Toledo	1150	2521	2318
Youngstown	1098	2536	
OKLAHOMA			
Oklahoma City (CO)	720	1543	1418
Oklahoma City	734	1571	
Tulsa	776	1603	
OREGON			
Baker (CO)	1257	3020	2928
Baker	1347	3291	
Burns (CO)	1258	3036	
Eugene	851	1894	
Meacham	1252	3260	
Medford	898	1939	1914
Pendleton	1063	2309	
Portland (CO)	790	1698	1711
Portland	845	1906	
Roseburg (CO)	759	1612	1725
Salem	814	1959	
Sexton Summit (CO)	983	2444	
Troutdale	828	1918	
PENNSYLVANIA			
Allentown	107	1357	
Curwensville	1179	2971	
Erie (CO)	955	2163	2211
Harrisburg	954	2070	2011
Park Place	1107	2679	
Philadelphia (CO)	763	1590	1701
Philadelphia	808	1696	
Pittsburgh (CO)	881	1934	1991
Pittsburgh	937	2114	2149
Reading (CO)	873	1872	1936
Scranton (CO)	1003	2315	2315
Williamsport	1074	2408	2273
RHODE ISLAND			
Block Island	800	1733	1904
Providence (CO)	883	1916	2127
Providence	936	2260	
SOUTH CAROLINA			
Charleston (CO)	314	642	694
Charleston	338	735	
Columbia (CO)	454	925	973
Columbia	492	1001	
Florence	415	939	
Greenville	613	1249	1189
Spartanburg	625	1290	
SOUTH DAKOTA			
Huron	1671	3653	3062
Pierre	1521		2793
Rapid City	1471	3430	2778
Sioux Falls	1577	3548	
TENNESSEE			
Bristol	754	1721	
Chattanooga	645	1380	1265
Knoxville	669	1180	1449
Memphis	594	1320	1214
Nashville	655	1499	1399
TEXAS			
Abilene	508	1038	1049
TEXAS (Cont'd.)			
Amarillo	803	1746	1651
Austin	360	677	670
Big Spring	515	1019	1048
Brownsville	93	184	249
Corpus Christi	173	333	362
Dallas	479	932	912
Del Rio (CO)	325	567	644
El Paso	569	1014	1075
Ft. Worth	475	927	902
Galveston (CO)	196	389	417
Galveston	207	407	
Houston (CO)	239	485	
Houston	251	515	513
Laredo	161	309	
Lubbock	701	1486	
Palestine (CO)	400	783	828
Port Arthur (CO)	241	502	520
Port Arthur	267	567	
San Angelo	413	879	
San Antonio	319	593	562
Victoria	229	456	
Waco	432	829	
Wichita Falls	596	1216	
UTAH			
Milford	1303	2774	
Salt Lake City (CO)	1101	2326	2177
Salt Lake City	1199	2539	2378
VERMONT			
Burlington	1234	2894	2933
VIRGINIA			
Cape Henry	549	1039	1191
Lynchburg	789	1683	1573
Norfolk (CO)	520	1048	1198
Norfolk	582	1164	
Richmond (CO)	676	1416	1472
Richmond	710	1501	
Roanoke	746	1685	1616
WASHINGTON			
Ellensburg	1289	2959	
Kelso	852	2167	
North Head (CO)	726	2279	2137
Olympia	885	2221	
Port Angeles	766	2628	
Seattle (CO)	771	1820	1783
Seattle	877	2226	
Spokane	1319	3029	2616
Stampede Pass (CO)	1293	4014	
Stevenson (CO)	896	2045	
Tacoma (CO)	819	2046	2044
Tatoosh Island (CO)	752	2652	2551
Walla Walla (CO)	1041	2162	1989
Yakima	1194	2695	2387
WEST VIRGINIA			
Charleston	756	1734	
Elkins	940	2381	2274
Huntington	747	1651	
Parkersburg (CO)	834	1386	1891
Petersburg	896	1996	
WISCONSIN			
Green Bay	1376	3453	2946
La Crosse (CO)	1436	3186	2843
La Crosse	1123	3350	
Madison (CO)	1346	3083	2766
Milwaukee (CO)	1242	2832	2585
Milwaukee	1270	2986	
WYOMING			
Casper	1376	3298	
Cheyenne	1251	3269	2942
Lander	1389	3428	3362
Rock Springs	1412	3591	
Sheridan	1150	3476	
WISCONSIN			
Madison	1379	3196	
CORRECTIONS:			
ALASKA			
October 1951			
Anchorage	1028	2001	
Annette Island	641	1389	
Barrow	1308	3568	4141
Bethel	1057	2377	2367
Cordova	880	2003	
Fairbanks	1318	2224	2297
Galena	1328	2542	
Gambell	1001	3061	
Juneau	832	1693	
Kotzebue	1262	2846	
McGrath	1251	2384	
Nome	1090	2781	2758
Northway	1494	2569	
St. Paul Island	796	2449	
Umiat	1675	4772	
Wales	1100	4005	
Yakutat	774	1837	

Data from airport unless otherwise specified. CO indicates data from city office.

Table 4

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Lakeport, Lake County, Calif.	1								Electrical	Lightning virtually demolished an unoccupied cabin near Lakeport.
Oakville, Napa County, Calif.	1					1	See remarks		Wind	Strong winds downed a giant eucalyptus, crushing corner of a dwelling; one room sheered off and child in adjacent room injured.
San Francisco, Calif.	1								do	Wind speeds as high as 69 m.p.h. afforded first major test of strain and stress on span of Golden Gate Bridge since it was opened in May 1937. Traffic halted on Bridge for almost 3 hours as the massive span swayed. As a result of the wind, repairs were necessary in expansion joint guide assembly of floor system where wear and tear of traffic occur. Strains sustained were far less than Bridge designed to withstand, it was reported.
San Diego area, Calif.	1-5							$500,000	Wind and rain	Winds and rains in San Diego area during first week resulted in losses to the tomato crop estimated at $500,000. Winds also damaged some avocado fruit and trees at Escondido and caused scattered damage to power and telephone lines.
Skull Valley, Ariz.	3	6 p.m.			0	0	$500		Wind	Several trees blown over; corral fences and barn damaged by falling trees.
San Francisco Bay area, Calif.	3						See remarks		Wind and rain	In San Francisco, a $25,000 home tumbled down side of a hill and collapsed after its foundation had been weakened by waters from a broken storm sewer. Elsewhere, trees uprooted, trolley wires downed, traffic slowed, windows smashed, basements flooded, etc. In Berkeley, strong winds forced a huge tree down smashing two parked cars. Radio Station KPFA in Berkeley went off the air when gusty winds knocked off its 105-foot tower, smashing its $3,500 antenna. Down the peninsula, Burlingame hardest hit. Flood waters filled streets and marooned shoppers. Some new subdivisions along Bayshore Highway hard hit by rising waters.
Kathleen, Fla.	4	12:25-12:40 p.m.	25	3 to 5	0	0	800	0	Tornado	Tornado moved northeastward, leaving an interrupted path; thus, indicating skipping or bouncing action. Demolished a packing shed and a garage and downed about a dozen trees.
Port Angeles, Wash.	4	5 p.m.					5,000		Wind	Strong east to northeast winds, accompanying a general disturbance, did considerable damage to harbor installations at Port Angeles, and broke up and scattered a number of large timber rafts containing in total more than 100,000 feet of lumber. Actual loss was mostly to harbor installations, booms, etc.
Oregon	4-5	Afternoon, 4th morning, 5th		Several hundred	4	2	Over 500,000	10,000	Wind and rain	An exceptionally low pressure area, of record proportions at some points, moved across the northwestern part of the State. Accompanying high winds were reported to have reached sustained speeds of 100 m.p.h. in Coos Bay area, with gusts up to 120 m.p.h. At Portland a fastest mile of 57 m.p.h. was recorded. At Eugene gusts up to 70 m.p.h. were noted. Hardest hit by storm was coastal area near Coos Bay and Coquille, although rather extensive damage experienced over much of State. Roofs ripped off of buildings; older or less substantial buildings demolished; outdoor signs of all types blown over and broken; windows broken; burner at one large saw mill blown over, starting a fire that caused $75,000 worth of damage; and power and communication lines seriously damaged over widespread areas, with extensive service interruptions. Man killed when a truck he was driving was overturned by wind near Vancouver, Washington barracks. Two other men killed near Reedsport when a tree crashed down on car. At Junction City an oak tree toppled over on a shed killing a man.
Palouse, and Colfax, vicinities, Whitman County, Wash.	4-5	All night					See remarks		Wind, ice (glaze), and snow	Strong winds from a general disturbance, accompanied by freezing rain and snow, did considerable damage to electric and telephone transmission lines. More than 75 local electrical circuits put out of commission by action of high winds and falling trees. Considerable loss to electric lines in Whitman County.
New Orleans, La.	5	2 a.m.	200	**400	0	2	750,000	0	Tornado, wind, and rain	Tornado developed during passage of a severe thundersquall caused by passage of an upper cold front. High winds covered a large area in and west of city, with 43 m.p.h. at Moisant Airport (gusts to 69 m.p.h.). Damage to plate glass windows occurred on Canal Street, several miles from tornado path.

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										Tornado dipped down to earth after passing over a thickly populated negro section and struck commercial and industrial buildings within a 3 to 4 block area, unroofing buildings and scattering merchandise and equipment over streets. Walls and windows blown out by explosive effect of sudden drastic lowering of pressure as funnel passed over. Trees in path surprisingly little damaged. The two injuries were not in connection with the tornado but occurred during blinding, wind-driven rainstorm when autos drove into sides of trains that stopped across intersections.
Thomasville, Ga.	5	10 a.m.					$5,000		Wind (tornadic) and rain	High winds, possibly of tornadic character, struck northern and western sections of Thomasville. One home heavily damaged, and a number of other buildings moderately damaged, partly from high winds and from falling trees. Telephone and power lines blown down, disrupting services for several hours.
Kingman, Ariz.	5	1 p.m.			0	0	600		Wind	Trees blown down, and several buildings unroofed.
Bowling Green, Ky.	5	2-2:15 p.m.	*2-3				2,500		Hail	Chief damage to wing fabric of aircraft at airport. Average size of hailstones 3/4 inch.
Pennsylvania, south-central counties	5-6	Overnight			1	7			Rain	Rain-swept highways and reduced visibilities caused series of traffic accidents.
Missouri, northwestern two-thirds	6	All day	*250	300		1	Small		Wind	Straight winds reached average speeds of 59 m.p.h. for 1 minute with gusts to 72 m.p.h. at St. Joseph. One man near Carrollton blown off feet and injured.
Kansas	6	Most of day					See remarks		do	Strong winds over State most of day blew limbs from trees, blew out plate glass window in Topeka, caused considerable blowing of silt and sand in Kaw Valley, and moved some topsoil in western counties. Gusts to 67 m.p.h. recorded at Topeka, with slightly lower speeds in west.
Eugene (near), Ore.	6	3:40-3:53 p.m.	50	**500	0	0	A few hundred dollars	$ 0	Tornado and hail	When observed in formative stage funnel was just beginning to rotate and it soon formed the column, which from the airport did not appear to reach the ground. It moved along for 4 or 5 minutes then lifted into parent cloud, after 13 minutes from time of beginning. Large hail was reported to have fallen; however, at the Weather Bureau Office, 4 miles south of the tornado path, snow pellets up to 1 inch across fell. The tornado moved from northeast to southwest, and it did, however, reach the ground along a path about 150 feet wide and 500 or more yards long. It lifted a 50- by 32-foot machine shed and spread debris along its path for about 150 yards. No other damage occurred to buildings and no large trees were in the storm path.
Spring Valley, Ill.	6	6 p.m.	100	25	1	1	210,000	8,000	Tornado	First observed when it hit southeastern edge of city of Spring Valley. A railroad depot demolished; man killed by falling debris. Tornado's northeastward path did not cross other thickly populated areas.
South Dakota, central and south-central portions	6								Snow	Severe snowstorm on 6th started pattern for frequent snows thereafter and problem of snow-blocked roads. This first storm began with some freezing rain which later turned to heavy snow and strong winds. Up to 14 inches of snow fell at this time. The area from Gregory County west through Todd County and then north through Pierre received the heaviest accumulation of snowfall, and it was within this area that the roads remained blocked for longer periods of time and some communities were temporarily isolated. Reports of 1½ to over 2 feet of snow were common over this area, while drifting conditions made this snowcover much more hazardous. A few light aircraft called into service to distribute food supplies and fuel and to evacuate those persons in need of hospitalization.
Crossville (near), Tenn.	7	About 3 p.m.					See remarks		Wind	High winds about 3 p.m., during heavy thunderstorm, caused considerable property damage.
Centerville, (near), Tenn.	7	Afternoon			1	2			Rain	The death and injuries were in connection with an auto accident which occurred in a blinding rainstorm.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
Pennsylvania, south-central counties	7	Evening			3	15			Rain	Rain-soaked highways and reduced visibilities caused series of traffic accidents.
Columbia, Tenn.	7						See remarks		Rain and electrical	Heavy rain caused a flash flood at Columbia. Lightning struck a 6 room home near Columbia and fire destroyed it.
Lawrenceburg and Crawfish section (4 miles northwest of Lawrenceburg), Tenn.	7	Unknown				3	See remarks		Thunderstorm	At Lawrenceburg two persons were injured and numerous buildings damaged or destroyed. In Crawfish section one person was injured, two barns wrecked, and one home badly damaged. Total damages in middle Tennessee area by storms of 7th estimated at $500,000.
Vicksburg, (12 miles southeast of), Miss.	8	5:30 p.m.	350	1/2	0	0	$5,000	$ 0	Tornado	Store and two homes damaged, trees uprooted, and telephone lines damaged.
Missouri	8-25				17		Small		Ice (freezing rain) and snow	Glaze storms, primarily on 14th, 17th, 20th, and 25th, coupled with snow-covered highways, resulted in 17 traffic deaths. Winds blew down some wires which were ice-coated on 18th in eastern Missouri.
Beaumont area, Calif.	9-11						See remarks		Wind	Strong winds in Beaumont district on 9th, 10th, and 11th damaged many roofs and television antennae. In Cherry Valley an entire roof was blown off by high winds. In Banning gale force winds damaged private homes and blew out one end of a hangar at airport. Dust plagued housewives as it sifted in through every possible crevice.
Kansas	14	Early a.m.							Snow and ice (glaze)	Ice and packed snow with temperatures below zero made driving hazardous in many sections of State. Stalled cars and minor accidents numerous.
Washington, D. C. and Metropolitan area	14	11:08 a.m. to midnight							Snow, sleet, and ice (freezing rain)	Snow, sleet, and ice accumulated to a maximum depth of 3 inches by 5 p.m. Rain continued to fall until after midnight. Traffic tieup due to slippery streets and highways reported to be the worst in history of city. Government workers released early, but many unable to reach their homes until after traffic jams of automobiles, busses, and street cars broke up between 8 and 9 p.m. Several traffic accidents, mostly of a minor nature attributed to icy conditions. Telephone services also disrupted due to overload.
Pennsylvania, entire state	14-15	12 noon, 14th-5 a.m., 15th			6	13			Snow, sleet, ice (glaze)	Season's first heavy snow, followed by mixed sleet and freezing rain, resulted in worst traffic snarl in history in southeastern counties, with an estimated 100,000 vehicles stalled in jams for hours. Thousands of vehicles abandoned overnight, with dry gas tanks or run-down batteries. Fifteen school children marooned aboard a trolley in Philadelphia for nearly 12 hours. Dial telephone systems failed to function under excessive load of calls. Over State six persons died from heart attacks while shoveling snow. Thirteen injured in traffic accidents. Innumerable minor traffic skidding accidents and pedestrian falls on icy walks and highways.
New Jersey, entire state	14	Afternoon and early evening			5	20	30,000		Snow, sleet, and rain	Heavy snow fell during late afternoon rush traffic period, causing in city areas what was termed "the worst traffic tie-up in the history of New Jersey". Commuters, who ordinarily arrive home in 20 to 30 minutes, were delayed from 4 to 9 hours. Many hundreds of drivers abandoned cars and walked. Most property damage, and all deaths and injuries, were the result of traffic accidents.
New England, entire section, except south and east coastal areas	14	5 p.m.-11 a.m.			19		No estimate		Snow and ice (freezing rain)	First general and heavy snowstorm, with 3 to 12 inches in all interior districts. Extreme slipperiness caused innumerable traffic blocks and minor accidents. Fatalities mostly due to over-exertion in shoveling snow or combatting storm.
Harlan County, Ky.	11						5,000		Wind	Damage to telephone and light wires, small buildings, awnings, windows, and small trees.
Iowa, east-central portion	14					Numerous	See remarks		Snow	Heavy snow blanketed east-central, with record snowfall of 13.2 inches at Clinton. All traffic slowed, with numerous accidents and many minor injuries. In Clinton damages in six accidents estimated at $1,687. Severe traffic jams on highway between Newton and Grinnell and on Highway No. 6 in Des Moines. Schools

See footnotes at end of table.

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										closed in many localities of east-central.
Baltimore, and various other localities in central and western Maryland	14–20				7	21 possibly more	See remarks		Snow, sleet, and ice (freezing rain)	Storms passed through the area on 14th, 18th, and 20th, causing traffic snarls, ice on roads, and numerous multiple-accidents. Two persons died near Pasadena from carbon monoxide poisoning, while parked in car during storm. One man killed at Salisbury by skidding truck on 18th. Another man killed as he slipped on ice in Baltimore on 20th. Theatre in Hagerstown collapsed under weight of snow, injuring two persons. Eight persons injured by falls on ice on 18th.
Island of Kauai, Hawaiian Islands	16						See remarks		Wind and rain	Falling limbs and trees caused local interruption to utility services. Some roof damage in Waimea. Flooding of Waimea River caused some homes to be temporarily evacuated; damage reported not extensive.
Watertown and vicinity, N. Y.	17								Snow and wind	Heavy snow over a radius of 25 miles from Watertown practically paralyzed area. Approximately 3 feet of snow added to heavy fall of 15th; accumulation was between 4 and 5 feet. All highways blocked, drifts 8 to 10 feet deep. City buses and taxis stopped. Schools and factories and many business places closed.
Spokane, Whitman, and Garfield counties, Wash.	17–18	1 p.m., 17th, - afternoon, 18th					See remarks		Snow	A record heavy snowstorm brought 20 to 26 inches of snow to east border counties from Spokane southward through Whitman and Garfield Counties in a 2-day fall. Depths in Spokane (city) reached 26 inches on 18th. City and highway traffic badly tied up and many rural areas isolated by snow which in places accumulated in drifts of great depth. Damage largely confined to broken electrical and telephone lines in area extending from Spokane southward across Palouse area to Garfield County.
Washington, D. C. and Metropolitan area	18	6:06 a.m. to 3:10 p.m.				Several			Snow, sleet, and ice (freezing rain)	Snow, sleet, and ice accumulated to a maximum depth of 1 inch by 1:30 p.m. Rain continued until 3:10 p.m. Streets and sidewalks in hazardous condition from 7 a.m. until 3 p.m. Several persons hospitalized due to broken bones or other injuries sustained in falls on ice.
Virginia, central and western portions	18	Morning			2	Many	See remarks		Ice (glaze), sleet, and snow	Schools closed in many counties. Icy limbs broke and pulled down power lines and disrupted electric service in parts of the Richmond area. Airplane flights cancelled. Icy roads and streets caused many accidents. Christmas shopping slowed.
New England, entire section	18	Noon-midnight			5	6	$10,000		Snow, rain, ice, and electrical	Another general snowstorm, changing to freezing rain and rain in south portion with intense electrical discharges about 6 p.m. A man in Laconia, N. H., knocked unconscious by lightning while plowing snow. In Middlesex and Suffolk Counties, Mass., many chimneys and fire alarm systems damaged. In Medford dense rain and smog blinded vision of engineer of suburban train, and a Diesel engine struck the rear car; five commuters injured.
Jacksonville, Fla.	18	2:30 p.m.	35	**500	0	0	2,000	$ 0	Tornado	Tornado moved north-northeastward. Major damage to roofs of two houses and minor damage to roofs of seven others.
Pennsylvania, entire state	18	Daytime			3	21	See remarks		Snow and wind	Second heavy snow plus high winds closed off dozens of rural roads and slowed or intermittently stalled traffic on main roads. Many schools were closed. Two of the deaths were from traffic accidents and one from heart attack while shoveling snow. Winds drifted snow and broke several show windows, with gusts reported as high as 52 m.p.h.
Dukes County, Mass.	18	6-6:30 p.m.			0	0	7,000	0	Tornado	During above-mentioned storm (New England, entire section) a local center of most violent action passed over Ocean Heights, a summer community about 2 miles from Edgartown. There were few witnesses, darkness had fallen, and most of the damaged summer cottages were vacant. In one cottage the walls bulged outward; another was lifted off its foundation and set down intact, without breaking any window panes; another lost its storm windows and frames, all completely disappeared; a garage disintegrated, walls and roof nowhere to be seen. These effects were momentary. One of the few persons in residence stated "I felt for a second as if I were in the middle of a vacuum and the house seemed to be trying to break away from its foundations. The house vibrated and the sink began to gurgle".
Ft. Meade, Fla.	18	6:45 p.m.	100–200	5	0	0	50,000	200	do	Tornado moved eastward, or a few degrees north of east. It wrecked roof of citrus packing warehouse,

See footnotes at end of table.

Table 4--Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
										damaged REA power lines, downed trees, and uprooted and otherwise damaged orange trees.
St. Petersburg, Fla.	18	Early evening	100	1	0	0	$2,500	$ 0	Tornado	Tornado moved eastward in northern part of city. It demolished a storage shed, wrecked a garage, and caused other lesser damage to buildings and signs.
Lake Moody (3 miles north of Frostproof), Fla.	18			Short	0	0	0	See remarks	do	Some citrus trees uprooted, and fruit removed from others.
Nassau County, N. Y.	18								Snow, ice (glaze), and rain	Beginning as snow and freezing rain, storm paralyzed traffic and made walking hazardous. Approximately an inch of rain backed up in storm sewers, flooding highways to a depth of 2 to 3 feet. Some homes and cellars flooded also.
North Carolina, western half	18-20					See remarks	See remarks		Ice (glaze)	Traffic paralyzed in mountains and restricted in rest of western part of State due to freezing rain. Property damage largely in form of minor automobile accidents of which there were many, both in cities and on open highways. Minor injuries in the hundreds and a few broken bones, resulted from slipping on sidewlks and steps.
Colorado, southwestern portion	19				1				Low temperatures, snow, and wind	Wind-drifted snow blocked many roads and halted transportation. One person died from freezing after she abandoned truck in snow drift in Dove Creek area.
Pennsylvania, entire state	20	10 a.m. - midnight			1	9	See remarks		Snow, sleet, ice (glaze), and rain	Third severe storm in a week. One man collapsed and died from exposure while trudging through snow to his home near Reading. Traffic and pedestrian accidents continued. About 52 persons have been treated at Harrisburg hospitals alone in past week, for injuries suffered on icy streets and walks. Snow, saturated by rain, caused collapse of at least 2 roofs, with much minor damage to eaves troughs. Highway and air travel seriously disrupted. Rains caused spotty temporary flooding on highways.
Washington, D. C. and Metropolitan area	20	11:15 a.m. to midnight				1			Snow, sleet, and ice (freezing rain)	Streets and sidewalks in hazardous condition due to snow, sleet, and ice. A man slipped on the ice in a railroad yard and lost both legs when he fell under a moving train.
Louisville, Miss.	20	3:15 p.m.	900	2	0	0	20,000	0	Tornado, hail, and rain	One building destroyed and several damaged. Tornado attended by hail and followed by heavy rain.
Virginia	20	Daytime				Many			Rain, sleet, and snow	Planes grounded. Some schools closed. Holiday shopping hindered. Many minor traffic accidents. Quite a number of people injured in falls on slippery pavements.
Kansas, eastern portion	20	Day and evening				Few			Snow, ice (glaze), and wind	Thin layers of snow and ice, with blowing snow from winds up to 45 m.p.h., made driving hazardous on most highways in eastern Kansas. Many highway accidents reported, including 20 in Topeka. Some minor injuries, but no fatalities.
Flaxville, Mont.	24	Evening			2				Severe cold and drifted snow	Two men died from exposure when car stalled due to drifted roads.
Illinois, central portion	25	Early a.m.					5,000		Ice (glaze)	Heavy glazing hampered heavy holiday traffic and caused numerous accidents.
Kansas, east central and northeastern portions	25	Morning				Numerous			do	Highways in large area were a solid glaze, and traffic greatly hampered. An undetermined number of injuries occurred from accidents caused by skidding cars.
Pennsylvania, central portion	25	Afternoon			4	13			Snow, sleet, and ice (glaze)	Light precipitation coated highways with thin layer of ice until rising temperatures brought relief during night. Four persons were killed and 13 injured in highway accidents. Ice jams on rivers caused minor local flooding until water pressure broke them. Three $800 barges torn loose and carried downstream from Harrisburg by ice. Skidding accidents common remainder of the month because of icy highways.

See footnotes at end of table.

Table 4—Continued

Place	Date	Time	Width of path, yards	Length of path, miles	Number of persons		Estimated damage		Character of storm	Remarks
					Killed	Injured	Property (exclusive of crops)	Crops		
New England, entire section	25–26	3 p.m., 25th–11 a.m., 26th				See remarks			Snow and rain	Another general snowstorm, changing to sleet and rain in south portion, followed by freezing. It caused extremely hazardous travel conditions. There were some 50 highway mishaps in the Greater Boston area, and hundreds throughout the Section.
Battle Creek, Mich.	26						$8,000		Snow	Building collapsed under weight of heavy snow.
Flint, Mich.	26						8,000		do	Warehouse collapsed under weight of heavy snow.
Hillsdale, Mich.	26						8,000		do	Barn collapsed under weight of heavy snow.
Owosso, Mich.	26						9,000		do	Steel marquee, 44 feet long and 12 feet wide, collapsed in street.
Arctic Drainage District and western Alaska north of Alaska Range, Alaska	26–28				4		38,500		Wind	A storm, moving northeastward from Bering Sea into Arctic Ocean, caused high winds over most of western Alaska north of the Alaska Range on 26th and 27th and over Arctic Drainage District from 26th to 28th with all stations reporting maximum winds on 27th. Barrow recorded an all time record fastest-mile of 70 m.p.h. on 27th; Fairbanks observed a fastest-mile wind of 45 m.p.h. for a new December record; Umiat recorded a fastest-mile of 75 m.p.h. from the west-southwest; Kotzebue, 62; and Galena 60. At Barrow, electrical power lines blown down, causing house to burn, fatally burning woman and three children. Roof of Weather Bureau tractor garage blown off. Umiat reported peak gust of 98 m.p.h. at 2:45 p.m., A.S.T., on 27th, with minor damage to buildings and structural damage to three small aircraft. At Farewell, three 82-foot V.H.F. towers blown down and one building blown away; as far south as Iliamina, a CAA mast and antenna blown down. The estimated damages of $7,500 at Barrow, $1,000 at Umiat, $26,000 at Farewell, and $4,000 at Iliamina, do not include expensive road clearance work caused by blowing and drifting snow.
Annapolis, Md.	27	P.m.					100,000	None	Wind	Bay bridge span, being towed into position broke loose from the tugs during windsquall and rough waters, ramming the bridge's supporting structure. Span had to be beached on sand, and was not floated again for 2 weeks.
Los Angeles (metropolitan area), Calif.	28–30						80,000		Rain	Heavy rains in Los Angeles metropolitan area, Downey, Venice, Van Nuys, and southwest sections of Los Angeles area from 28th to 30th brought damage from accumulation of water in low, flat areas. Buildings, homes, and automobiles partially inundated in many instances. Losses to buildings, automobiles, merchandise, home furnishings, etc., estimated at $80,000.
Coconino County (southeastern part), Ariz.	29–30				0	0	20,300		Rain and wind	High winds damaged two moored airplanes at Flagstaff. Extensive damage by ice accretion on power and communication lines above 6,000-foot elevation. Main part of storm along "Rim" section from south of Flagstaff to north of Payson. Several short creeks flooded, as a result of heavy rains which reached 4.00 inches in Flagstaff area for the 2-day period. Oak Creek, lower Beaver Creek, and Verde River near Camp Verde experienced some damaging high water. Four privately owned foot or vehicle bridges across Oak Creek washed out, two houses flooded, one small barn destroyed, and several water supplies flooded in vicinity of Sedona. South Camp Verde bridge damaged slightly by high water; a few fences downed and ditches flooded in area. Montezuma Castle National Monument had minor rain damage to trails and picnic area.
Colorado, western portion	29–31				6		200,000		Snow, low temperatures, and avalanches	Unusually heavy snows, accompanied by high winds, and resulting in record fall and accumulation at many points, occurred over greater portion of western Colorado on 29th, 30th, and 31st. Many small buildings collapsed due to excessive weight of snow. Service over power, telephone, and telegraph lines disrupted. Most roads, highways, and practically all mountain passes closed to transportation. Avalanches and snowslides marooned trains, trucks, and hundreds of motorists. One truck swept from highway on Wolf Creek Pass, causing death of two occupants; a third rider escaped with minor injuries. Freezing claimed two lives near Rico, one near Silverton, and one at Blue Lakes in Jefferson County.
Riverside County, Calif.	30								Rain	Rains brought a flash flood cascading down east slopes of San Jacinto Mountains that washed out a portion of highway east of Palm Springs.

* Miles instead of yards.
** Yards instead of miles.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

DECEMBER 1951

There was no major flooding during December 1951. Most of the overflows were minor to moderate with resulting damages insignificant in comparison to one year ago when severe floods occurred in the Central Valleys of California and western Nevada. One of the worst ice jams in 20 years was reported on the Allegheny River about 8 miles above Oil City, Pa.

ATLANTIC SLOPE DRAINAGE.--Precipitation in the Merrimack River Basin continued above normal throughout December with some brief thawing periods. Snowfall was heavy in all but the extreme south portion of the basin. Runoff in the Merrimack Basin was far above normal for the month. While stages were rather high, no bankfull levels were reached.

Snowfall was above average in the Lake Champlain drainage but most of it had melted at lower elevations by the end of the month.

Moderate rises occurred in the Susquehanna River on the 6th and 7th from the heavy rains (1 inch) on the 4th and 5th. Moderate rainfall on the 9th caused minor rises on the 10th and 11th. A series of snowstorms during the last two-thirds of the month deposited a snow mantle, containing 1 1/2 to 2 inches of water, over most of the basin by the end of the month. Ice was first reported in the streams about the 14th which continued to build up the rest of the month. Stages showed sharp fluctuations due to ice movement, particularly on the 22d when gorges were reported above Clearfield, Lock Haven and Sunbury, Pa., and on the 23d above Harrisburg, Pa. Slight lowland inundation of short duration occurred at a few places but damage and inconvenience were insignificant and sufficient channels opened to relieve pressure.

Minor flooding occurred along the James River at and below Bremo Bluff, Va., on December 21-22 due to heavy rains on the 20th-21st. The rains averaged 1 to 1.5 inches over the extreme upper and extreme lower portions of the basin, 1.5 to 2 inches in the section crossed by the Blue Ridge, and 2 to 3 inches in the Piedmont Area. These rains fell on mostly frozen ground and brought an immediate rise in the river to a little over 1 foot above flood stage below Scottsville, Va., except at Columbia, Va., where it crested 3.7 feet above flood level.

Heavy rains on the 20th-21st over eastern North Carolina caused overflows along the Roanoke, Neuse and Cape Fear River Basins during the last decade of the month. No damage was reported.

Minor flooding occurred along the Pee Dee River at Cheraw and Peedee, S. C., during the last ten days. Large areas of swamp lands were inundated from Peedee southward but losses were confined to time lost by lumber operators and cattle and hog grazers.

Heavy rains of about 3 inches in northwestern South Carolina on the 21st and 22d caused light flooding on the Broad and Saluda Rivers and some moderate flooding in the lowlands below Columbia, S. C., on the Congaree River. Some grain in bottoms was lightly flooded, but no damage was reported.

EAST GULF OF MEXICO DRAINAGE.--Rainfall occurred frequently during the month over the Apalachicola and Altamaha River Systems with measurements up to 1 inch or more on the 4th, 15th, 18th, 20th-21st, and 26th. The most important rains of the month were those of the 20th-21st when falls of 2 to 4 inches were reported in upper streams and 1 to 2 inches in the lower streams. These rains caused only light flooding on the Apalachicola and Chattahoochee Rivers.

Heavy rains on the 18th followed by additional heavy rains on the 20th and 21st caused a moderate flood on the Warrior and Tombigbee Rivers. Additional rains on the 26th caused secondary crests at the stations on the upper rivers. Floods of this nature are expected in this season so there was little property loss.

Light flooding occurred on the Etowah and Cahaba Rivers and moderate flooding on the Oostanaula and Coosa Rivers in Georgia and Alabama due to heavy rainfall during the period from the 19th to the 21st. The damages totalled under $50,000.

UPPER MISSISSIPPI BASIN.--Light flooding occurred along the Rock River at Moline, Ill., between the 22d and the 27th due to high ground water flows and ice action. No damage resulted.

MISSOURI BASIN.--Record-breaking low temperatures (many below zero in the Dakotas) caused heavy ice to form on the Missouri River from Sioux City, Iowa, upstream to Bismarck, N. Dak., during the last 10 days of November. From Pierre, S. Dak., northward the open-water channel was very restricted and in many places nearly frozen over. This was followed by an unusually warm period during the first 10 days of December which caused an ice breakup. A minor rise came down the Missouri during the first week in December and heavy floating ice attended this rise. At Bismarck a stage of 13.4 feet was reached on November 30.

A two-week period of severe cold weather began again on December 13 and 14. By the middle of December, the Missouri was generally frozen over in the reach above Sioux City, Iowa. Floating cakes of ice were frozen together to leave a very rough ice surface over long stretches of the river. At the end of the month much of the river ice was covered with snow.

Snowfall was unusually heavy over portions of the Missouri Basin, especially over the central and eastern sections of the Dakotas.

The total snowfall at Sioux City was 11.1 inches during December which is about twice as much as the 60-year average of 5.8 inches. Likewise, the snow cover over most of the Dakotas appears to average two to three times the normal for those sections for so early in the winter.

OHIO BASIN.--Minor rises occurred in the Monongahela Basin on the 16th and in the Allegheny, Monongahela and Ohio Basins on the 22d. Moderate to heavy rainfall occurred over the watershed above Pittsburgh, Pa., on the 30th, and the resulting runoff combined with snow runoff caused the Allegheny and Monongahela Rivers to rise rapidly. An ice gorge approximately 8 miles in length jammed the Allegheny River about 8 miles above Oil City, Pa. The ice was piled 25 feet high in some places and local residents remarked it was the worst ice jam in 20 years. Damages from ice action to cottages and other property along the Allegheny River above Oil City, Pa., amounted to about $18,000. Several low-lying sections of highways in northwestern Pennsylvania were inundated due to local ponding occasioned by snow runoff and poor drainage, thus delaying traffic for several days. No severe damages resulted over the basin due to actual flooding.

The Ohio River was cresting in the reach below Addison, Ky., in the beginning of the month from the minor rise which began during late November, while in the upper reaches (above Dam 23) navigation dams were being raised. All tributaries were receding, or at base flow, except the lower Green River where minor flood stages were nearing crest.

The Ohio River was in pool downstream to Louisville, Ky., by the 4th when general rain over the Valley resulted in 24-hour falls of 2 to 3 inches in the reach below Louisville, and about 0.5 inch in the upper Valley. Thereafter, measurable precipitation was reported in some portion of the Ohio Basin on 22 of the remaining 27 days in December. Most of this precipitation was in the form of rainfall, except over the headwaters of the northern tributaries where up to 14-16 inches of snow had accumulated over the extreme upper Wabash Basin by the last week of the month. In the Tennessee Basin there was heavy rainfall on the 8th, 14-15th and 20th-21st which caused minor overflows in some portions of the basin. No damage resulted from the flooding. In general, the precipitation during December followed a rather consistent pattern, that is, heavy over the lower Ohio Valley, light to moderate over the upper Valley with the center over the Green Basin. The frequent precipitation resulted in navigation dams in the Ohio River Valley being lowered again by the 10th with open river conditions prevailing throughout most of the rest of the month. Several moderate rises occurred on the Ohio River, but high stages were confined to the lower reaches with flood stage resulting only at Dam 50.

WHITE BASIN.--The minor flooding in the lower White and lower Black Rivers in Arkansas was due to heavy rainfall from November 22 to 24. Damage from this flooding was negligible.

LOWER MISSISSIPPI BASIN.--The St. Francis River continued in flood at Fisk, Mo., from November 14 to December 6 and St. Francis, Ark., from November 19 to December 14. This prolonged flooding was due to heavy rains during the latter part of November.

Minor flooding occurred on the Tallahatchie River at Swan Lake, Miss., from the 24th through the end of the month reaching a crest of 28.2 feet, 2.2 feet above flood stage on New Year's Day. This overflow was due to the cumulative result of several moderately heavy rains during the month.

PACIFIC SLOPE DRAINAGE.--Minor flooding and sharp rises occurred in Ash Slough above Chowchilla, Calif., and in Mariposa Creek south of Merced, Calif., due to the heavy 48-hour rainfall from the 28th to the 30th. The rainfall during that period averaged 3.5 inches, with as much as 9.86 inches at one station and 6.49 inches in 24 hours at another. Early in the storm much of the precipitation fell as rain to elevations as high as 7,500 feet on a snow pack that extended as low as 5,000 feet. Very little snow melt resulted and most of the rain was absorbed into the snow pack. By the time the storm was over, the snow line fell to 3,500 feet.

During the last three days of November and the first five days of December, a series of cold fronts moving into the Sacramento and lower San Joaquin basins from the Pacific Northwest brought moderate to locally heavy precipitation from Sacramento and San Francisco northward. However, these were cold-type storms, in contrast to the very warm storms of November and December, 1950, and precipitation was in the form of snow above 4,500 feet. On December 5, 71 inches of snow at Norden, Calif., in the central Sierra Nevada was the greatest depth for so early in the season since 1913. A moderate crest that developed on the Sacramento River and the tributary rivers on the 1st resulted in stages downstream well below flood stage, but overflow occurred at Colusa and Tisdale Weirs into Sutter Bypass. Overflow also occurred at Fremont Weir into Yolo Bypass from December 4-7, reaching a maximum overflow depth of 1 foot on December 6.

Heavy rains from the 25th to the 28th caused rapid rises to bankfull stage in the tributary creeks of the Sacramento River below Shasta Dam. The rainfall on the morning of the 26th averaged between 7 and 10% of the annual basin normals in the northern coastal range, the northern Sacramento Valley and the northern Sierra Nevada. The upper Sacramento River rose to a stage of 25.5 feet by 10 p.m. on that date. The flow at Iron Canyon, just upstream from Red Bluff, Calif., increased from 6,000 cfs to 146,000 cfs in 36 hours. Overflow occurred between Red Bluff and Hamilton City in the lowlands adjacent to the river. Some isolated cases of limited residential flooding has been reported but most of the overflow land is used by agricultural and livestock interests. Flood stage was not reached at or below Hamilton City, but since this was the greatest flow in the Sacramento River since 1943, considerable concern was evident at all points. Heavy overflow occurred at all fixed weirs. In the Yolo Bypass the water reached a level sufficient to flood one of the three major island tracts inside the Bypass. Heavy flows also developed in Cache and Putah Creeks from the coastal range on the 26th. One case of flooding of the highway in the upper reaches of Putah Creek was reported.

Moderate flooding occurred on the Russian River on the 27th and 28th due to heavy rain (2.9 inches) on the 27th. Most of the damages were confined to erosion of agricultural lands, with some light crop damage.

A moderate flood occurred on the Eel River at Fernbridge, Calif., from the 27th to the 29th due to heavy rain from the 25th to the 27th. Most of the damage from this flood was due to erosion of farm lands.

FLOOD STAGE DATA

(All dates in December unless otherwise specified)

Table 5

River and station	Flood stage	Above flood stages -dates		Crest *	
		From—	To—	Stage	Date
	Ft.			Ft.	
ATLANTIC SLOPE DRAINAGE					
James:					
Bremo Bluff Va.	19	21	22	20.2	21
Columbia, Va.	18	21	22	21.7	21
State Farm, Va.	12	22	22	13.5	22
Richmond, Va.	8	22	22	9.2	22
Roanoke:					
Altavista, Va.	18	20	22	21.9	21
Randolph, Va.	21	20	23	25.6	23
Weldon. N. C.	31	21	28	34.7	25
Scotland Neck, N. C.	28	21	31	30.1	27
Williamston, N. C.	10	25	Jan. 5	11.4	31
Neuse:					
Neuse, N. C.	14	22	24	14.9	24
Smithfield, N. C.	13	--	--	13.0	24
Cape Fear: Elizabethtown, N. C. Lock No. 2	20	22	25	24.3	24
Pee Dee:					
Cheraw, S. C.	30	23	23	30.0	23
Peedee, S. C.	19	25	27	19.7	26
Saluda: Pelzer, S. C.	6	21	23	11.5	22
Broad: Blairs, S. C.	14	21	24	21.8	22
EAST GULF OF MEXICO DRAINAGE					
Chattahoochee: Norcross, Ga.	16	22	22	16.7	22
Apalachicola: Blountstown, Fla.	15	24	31	17.8	28
Oostanaula: Resaca, Ga.	22	23	24	23.0	23
Etowah: Canton, Ga.	17	21	22	19.2	21
Coosa:					
Gadsden, Ala.	20	21	30	23.6	23
Childersburg, Ala.	20	22	22	21.0	22
Cahaba: Centreville, Ala.	23	21	22	26.5	21
Black Warrior: Tuscaloosa Lock and Dam, Ala.	47	21 27	23 27	56.6 47.2	21 27
Tombigbee:					
Aberdeen, Miss.	34	22 27	23 31	35.1 37.6	22 28
Lock No. 4, Demopolis, Ala.	39	22	**	49.0	31
Lock No. 3, Ala.	33	19	**	50.3	Jan. 1
Lock No. 2, Ala.	46	24	**	51.5	Jan. 1
Lock No. 1, Ala.	31	25	**	35.1	31
MISSISSIPPI SYSTEM Upper Mississippi Basin					
Rock: Moline, Ill.	10	22	27	10.2	22
Ohio Basin					
Barren: Bowling Green, Ky.	28	9 16	12 17	33.1 28.5	10 17
Green:					
Munfordville, Ky.	28	9	12	34.1	11
Lock No. 4, Woodbury, Ky.	33	Nov. 25 5	1 29	39.6 43.9	Nov. 28 12
Lock No. 2, Rumsey, Ky.	34	Nov. 27	**	41.8	27
West Fork: Edwardsport, Ind.	12	5 26	15 **	18.3 16.2	9 28
White: Petersburg, Ind.	16	8 25	17 **	20.1 17.3	13-14 30-31
Cumberland:					
Williamsburg, Ky.	21	9 16 22	10 17 22	22.1 22.6 21.6	9 16 22
Nashville, Tenn.	40	16	16	40.3	16
Clarksville, Tenn.	46	10 16	11 17	47.0 46.7	11 17
Lock F, Eddyville, Ky.	50	11	31	53.8	19
MISSISSIPPI SYSTEM (Cont'd.) Ohio Basin (Cont'd.)					
First Creek: Knoxville, Tenn.	5	20	21	5.7	21
South Chickamauga Creek: Chickamauga, Tenn.	10	15 20	16 23	11.4 14.5	15 22
Elk: Fayetteville, Tenn.	659	8 21	8 21	662.7 662.0	8 21
Duck:					
Shelbyville, Tenn.	719	8	8	721.9	8
Columbia, Tenn.	32	8	10	34.8	9
Centerville, Tenn.	22	8 15	12 16	24.8 22.5	10 15
Tennessee:					
Whitesburg, Ala.	560	15 20	18 30	561.0 565.1	17 23
Florence, Ala.	18	15 21	15 28	18.1 19.7	15 27
Gilbertsville, Ky.	31	9	**	40.0	30
Ohio:					
Shawneetown, Ill.	33	15 26	17 **	33.4 35.1	16 30
Dam No. 50, Fords Ferry, Ky.	34	13	**	37.9	29
Dam No. 52, Brookport, Ill.	37	14	Jan. 4	39.2 40.5	18 30
Dam No. 53, near Mound City, Ill.	42	15	Jan. 4	43.5 44.1	17 31
Cairo, Ill.	40	15	Jan. 4	41.1 40.8	17 Jan. 2
White Basin					
Black: Black Rock, Ark.	14	Nov. 24	16	23.3	Nov. 27
White:					
Augusta, Ark.	32	Nov. 28	15	32.9	1
Georgetown, Ark.	21	Nov. 28	19	23.1	6
Des Arc, Ark.	24	2	20	26.2	9
Clarendon, Ark.	26	3	**	29.2	10
St. Charles, Ark.	25	8	**	27.3	14
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.	20	Nov. 14	6	23.1 24.0	Nov. 18 Nov.27-29
St. Francis, Ark.	18	Nov. 19	14	20.7 21.2	Nov. 25 Nov.30-Dec.1
Tallahatchie: Swan Lake, Miss.	26	24	**	28.2	Jan. 1
PACIFIC SLOPE DRAINAGE Sacramento Basin					
Sacramento:					
Red Bluff, Calif.	23	27	28	25.5	27
Moulton Weir	76.7	28	30	79.5	29
Colusa Weir	61.8	2 28	6 Jan. 1	64.0 62.8 66.0	3 5 29
Tisdale Weir	45.5	2 27	7 Jan. 3	47.5 48.5	3 29
Fremont Weir	33.8	4 29	7 Jan. 4	34.7 36.2	6 31
Russian: Guerneville, Calif.	29	28	28	29.8	28
Eel: Fernbridge, Calif.	17.5	27	29	23.2	27
Columbia Basin					
Santiam: Jefferson, Oreg.	13	Nov. 30 5 22	1 5 22	14.4 14.5 13.2	1 5 22
South Yamhill: Whiteson, Oreg.	38	5	6	40.9	5
Tualatin: Dilley, Oreg.	12	3	[illegible]	12.9	3
Willamette:					
Harrisburg, Oreg.	12	1 4 22	2 5 23	13.1 13.1 12.0	1 5 22-23
Oregon City, Oreg.	12	[illegible]	8	12.6	7

* Provisional.

** Continued at end of month.

RADIOSONDE DATA

Average monthly values

Table 20

DECEMBER 1951

	ALBUQUERQUE, N. MEX. (837 MB.)				ATLANTA, GA. (985 MB.)				BIG SPRING, TEX. (926 MB.)				BISMARCK, N. DAK. (954 MB.)				BOISE, IDAHO (915 MB.)				BROWNSVILLE, TEX. (1017 MB.)				BUFFALO, N. Y. (991 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,620	2.7	50	31	307	7.5	72	31	784	8.0	40	31	505	-14.1	81	31	868	- 2.0	82	31	6	17.8	79	30	221	- 1.0	78
1,000	31	153			31	179			31	136			31	145			31	156			31	146	13.2	75	30	141		
950	31	581			31	608	8.6	62	31	568			31	542	-17.2	71	31	575			31	593	17.1	70	30	558	- 1.6	71
900	31	1,031			31	1,051	7.8	57	31	1,017	9.8	33	31	952	-10.9	69	31	1,001	- 1.9	73	31	1,047	16.7	59	30	983	- 3.8	70
850	31	1,495			31	1,522	6.6	49	31	1,492	9.8	29	31	1,391	-10.3	64	31	1,456	- 2.3	68	31	1,534	15.7	52	30	1,432	- 5.7	68
800	31	1,987	1.7	43	31	2,018	5.3	44	31	1,993	7.7	27	31	1,858	-11.1	62	31	1,936	- 4.5	66	31	2,047	14.0	46	30	1,906	- 7.5	64
750	31	2,508	- 0.6	43	31	2,553	3.4	41	31	2,528	4.5	28	31	2,356	-12.9	57	31	2,449	- 6.8	63	31	2,595	11.2	41	30	2,410	- 9.3	56
700	31	3,054	- 3.6	44	31	3,101	1.0	40	31	3,081	1.8	26	31	2,875	-15.3	54	31	2,979	- 9.6	57	31	3,161	7.7	41	30	2,938	-11.2	48
650	31	3,637	- 6.5	39	31	3,700	- 2.3	39	31	3,680	- 0.7		31	3,438	-18.0	53	31	3,554	-12.4	54	31	3,775	3.9	39	30	3,511	-14.0	46
600	31	4,258	- 9.9	41	31	4,326	- 5.7	34	31	4,309	- 4.8		31	4,026	-21.2	48	31	4,156	-16.0	56	31	4,414	0.2		30	4,108	-17.4	43
550	31	4,925	-13.9	43	31	5,007	- 9.5	33	30	4,989	- 9.4		31	4,667	-25.1	45	31	4,808	-20.0	57	31	5,106	- 4.1		30	4,757	-21.1	40
500	31	5,642	-18.3		31	5,733	-14.4	35	30	5,714	-14.1		31	5,349	-29.7	45	31	5,507	-24.5	56	31	5,851	- 9.0		30	5,453	-25.2	
450	31	6,425	-23.1		31	6,530	-20.0	36	29	6,514	-19.8		31	6,099	-34.8		31	6,268	-29.9	52	30	6,672	-14.1		30	6,214	-30.0	
400	31	7,274	-28.8	38	31	7,386	-26.1	37	29	7,372	-25.8		31	6,905	-40.4		31	7,097	-35.4	51	30	7,545	-20.8		30	7,041	-35.2	
350	31	8,217	-35.5		31	8,338	-32.8	40	29	8,326	-32.4		30	7,808	-46.6		31	8,013	-42.0		30	8,518	-27.8	33	29	7,976	-40.6	
300	31	9,272	-42.8		31	9,406	-40.3		29	9,396	-40.1		30	8,817	-52.5		30	9,040	-48.3		30	9,607	-36.0		28	9,013	-46.7	
250	29	10,486	-50.0		30	10,624	-49.3		29	10,618	-48.2		29	9,983	-55.6		28	10,211	-53.3		30	10,847	-45.6		25	10,213	-52.7	
200	29	11,926	-55.6		27	12,044	-57.7		25	12,060	-57.5		27	11,400	-54.4		28	11,637	-55.3		29	12,294	-56.8		18	11,619	-56.2	
175	27	12,768	-57.9		24	12,880	-59.7		24	12,898	-60.5		25	12,245	-53.3		28	12,488	-55.6		28	13,128	-62.5		16	12,473	-54.7	
150	27	13,734	-60.2		23	13,833	-62.4		21	13,850	-63.2		24	13,237	-53.0		27	13,466	-55.6		27	14,069	-67.4		14	13,450	-54.9	
125	24	14,875	-63.3		19	14,966	-65.9		21	14,961	-66.7		23	14,411	-53.6		24	14,623	-56.1		22	15,150	-71.1		12	14,626	-55.2	
100	23	16,235	-66.4		12	16,307	-68.9		20	16,295	-69.5		19	15,825	-55.4		20	16,047	-56.1		19	16,452	-73.6		9	16,121	-58.0	
80	22	17,578	-66.3		10	17,640	-67.9		19	17,620	-69.1		14	17,307	-55.4		15	17,456	-57.5		16	17,764	-73.3		7	17,615	-58.5	
60	21	19,338	-62.9		6	19,370	-63.5		16	19,342	-66.2		11	19,127	-57.5		9	19,290	-55.7		15	19,468	-66.5					
50	17	20,480	-60.9		5	20,497	-60.1		15	20,456	-62.6		5	20,243	-58.6		5	20,448	-56.6		14	20,585	-61.7					
40	13	21,861	-58.5		5	21,905	-56.8		13	21,836	-59.3										10	21,972	-58.6					
30	12	23,672	-56.5						13	23,651	-54.8										8	23,792	-54.4					
20	5	26,255	-55.3						9	26,270	-51.9										5	26,377	-51.7					

	BURRWOOD, LA. (1019 MB.)				CAMAGUEY, CUB. (1004 MB.)				CARIBOU, ME. (922 MB.)				CHARLESTON, S. C. (1020 MB.)				CIUDAD VICTORIA, MEX. (975 MB.)				COLUMBIA, MO. (988 MB.)				DODGE CITY, KANS. (922 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	3	16.0	87	20	122	20.9	96	31	191	- 9.4	76	31	13	10.6	80	21	335	20.3	53	31	239	- 0.4	71	31	792	- 0.5	62
1,000	31	164	16.3	79	20	160	21.3	93	31	129	-11.3		31	180	12.9	71	21	117			31	138	- 9.2		31	132		
950	31	605	14.6	74	20	604	20.6	81	31	530	- 8.2	77	31	616	11.6	67	21	564	19.7	55	31	555		65	31	551		
900	31	1,056	13.5	60	20	1,073	17.6	77	31	946	- 8.4	73	31	1,062	9.7	58	21	1,026	17.2	57	31	982	- 0.8	62	31	987	2.2	48
850	31	1,536	12.0	53	20	1,561	15.5	74	31	1,387	-10.6	66	31	1,536	8.5	49	21	1,513	15.7	55	31	1,439	- 1.4	54	31	1,449	3.0	41
800	31	2,042	10.1	47	20	2,073	13.0	63	31	1,853	-11.8	61	31	2,036	6.5	46	21	2,026	14.3	58	31	1,921	- 2.3	49	31	1,940	2.0	37
750	31	2,582	7.8	40	20	2,616	11.1	40	31	2,352	-13.5	56	31	2,571	3.9	42	21	2,576	12.4	55	31	2,437	- 4.1	45	31	2,461	- 0.5	37
700	31	3,143	5.3	36	20	3,188	8.6		31	2,868	-15.6	51	31	3,122	1.2	34	21	3,146	9.1	52	31	2,974	- 6.7	46	31	3,006	- 3.9	36
650	31	3,749	2.1	30	19	3,801	5.5		31	3,430	-18.3	47	31	3,719	- 1.5		21	3,763	5.6	45	31	3,557	- 9.7	16	31	3,569	- 7.8	38
600	31	4,387	- 1.2		19	4,447	2.2		31	4,018	-21.1	46	31	4,343	- 5.0		21	4,407	2.0		31	4,163	-12.9	46	31	4,204	-11.6	40
550	31	5,075	- 5.4		19	5,145	- 1.8		31	4,660	-24.8	47	31	5,028	- 8.9		21	5,105	- 2.0		31	4,826	-17.0	47	31	4,867	-15.3	38
500	30	5,817	- 9.9		19	5,895	- 6.9		31	5,343	-29.1	45	31	5,759	-13.6		21	5,856	- 7.1		31	5,531	-21.0	43	30	5,582	-19.5	35
450	29	6,626	-15.4		19	6,718	-12.5		30	6,086	-34.0		31	6,557	-19.3		21	6,679	-12.4		31	6,305	-25.9	40	30	6,357	-24.6	36
400	29	7,503	-21.5		19	7,601	-18.6		28	6,898	-39.4		31	7,418	-25.7		21	7,563	-18.7		31	7,145	-31.9	39	30	7,205	-30.1	37
350	29	8,472	-28.6		19	8,580	-26.2		28	7,801	-44.5		31	8,372	-32.6		21	8,545	-25.6		31	8,075	-38.2		29	8,138	-36.8	
300	28	9,556	-36.5		17	9,681	-35.1		27	8,832	-47.9		31	9,439	-40.6		21	9,646	-33.8		31	9,121	-44.7		26	9,196	-42.9	
250	26	10,796	-45.8		15	10,940	-44.6		27	10,025	-51.0		31	10,657	-49.4		21	10,899	-43.8		31	10,323	-51.2		22	10,406	-49.8	
200	24	12,255	-56.3		15	12,397	-55.9		27	11,469	-52.8		30	12,092	-57.7		21	12,362	-55.6		28	11,764	-55.5		16	11,839	-54.5	
175	23	13,095	-61.1		14	13,233	-61.2		27	12,330	-52.9		30	12,928	-60.7		20	13,191	-62.2		27	12,609	-56.7		13	12,664	-56.0	
150	22	14,037	-66.0		14	14,178	-66.3		27	13,323	-53.3		30	13,878	-63.7		19	14,127	-68.5		26	13,578	-58.3		9	13,661	-55.5	
125	10	15,118	-69.8		13	15,265	-72.0		26	14,491	-54.1		29	14,986	-66.6		13	15,211	-72.3		24	14,720	-60.4		9	14,814	-58.5	
100	6	16,458	-71.2		9	16,582	-75.9		23	15,923	-55.3		28	16,329	-69.0		8	16,522	-73.8		22	16,124	-61.7		7	16,229	-60.0	
80									16	17,367	-54.8		25	17,665	-68.7						19	17,508	-62.4		7	17,614	-61.4	
60													20	19,402	-64.1						13	19,263	-60.6		5	19,413	-60.1	
50													17	20,522	-60.8						10	20,416	-58.7					
40													14	21,918	-57.9						6	21,895	-55.4					
30													12	23,734	-54.1													
20													5	26,310	-51.0													

	EL PASO, TEX. (882 MB.)				ELY, NEV. (807 MB.)				GLASGOW, MONT. (938 M3.)				GRAND JUNCTION, COLO. (852 MB.)				GREAT FALLS, MONT. (882 MB.)				GREENSBORO, N. C. (989 MB.)				HATTERAS, N. C. (1021 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	1,195	9.0	47	31	1,908	- 6.6	76	31	648	-13.1	74	31	1,474	- 6.0	80	31	1,128	- 8.6	66	31	273	3.5	79	31	3	10.8	83
1,000	31	137			31	186			31	152			31	193			31	143			31	180			31	177	11.6	70
950	31	576			31	607			31	551	-17.4		31	610			31	549			31	605	6.2	56	31	610	9.1	64
900	31	1,029			31	1,040			31	963	-10.2	66	31	1,040			31	973			31	1,044	4.9	56	31	1,052	7.0	56
850	31	1,502	9.7	39	31	1,491			31	1,404	- 9.7	59	31	1,488	- 5.9	73	31	1,417	- 7.1	57	31	1,509	3.4	50	31	1,520	5.0	43
800	31	2,003	7.1	39	31	1,972	- 3.9	68	31	1,871	-10.5	59	31	1,967	- 3.6	61	31	1,888	- 9.0	58	31	2,000	2.0	39	31	2,014	3.5	36
750	31	2,538	4.1	37	31	2,490	- 4.1	58	31	2,372	-12.5	57	31	2,483	- 4.8	58	31	2,390	-11.2	61	31	2,527	0.7	35	31	2,544	1.9	39
700	31	3,089	1.2		31	3,022	- 7.3	57	31	2,890	-15.3	56	31	3,016	- 7.6	56	31	2,912	-13.3	63	31	3,072	- 1.3	37	31	3,089	- 0.7	35
650	31	3,685	- 1.6		31	3,604	-10.2	58	31	3,456	-18.4	53	31	3,595	-10.8	56	31	3,481	-16.5	62	31	3,663	- 4.1	35	31	3,683	- 3.8	35
600	31	4,315	- 5.2		31	4,208	-13.5	53	31	4,040	-21.6	51	31	4,200	-14.3	56	31	4,071	-20.0	62	31	4,287	- 7.6	34	31	4,305	- 7.4	
550	31	4,994	- 9.4		31	4,869	-17.5	51	31	4,681	-25.3	49	31	4,862	-18.1	53	31	4,715	-24.3	61	31	4,961	-11.5		31	4,982	-11.2	36
500	31	5,723	-14.1		31	5,572	-22.5	48	31	5,362	-29.9	47	31	5,561	-22.4	52	31	5,399	-28.8	57	31	5,684	-16.3		31	5,704	-15.9	33
450	30	6,522	-19.6		31	6,343	-27.4	41	31	6,107	-34.7		30	6,338	-27.3	51	31	6,146	-33.7	51	31	6,473	-21.5		31	6,495	-21.2	
400	30	7,385	-25.8		31	7,176	-33.2		31	6,919	-40.2		30	7,169	-33.3	47	31	6,962	-39.3		31	7,327	-27.8	37	31	7,350	-27.3	
350	30	8,339	-32.2		31	8,101	-39.3		30	7,820	-46.2		30	8,093	-40.0		30	7,865	-45.5		31	8,275	-34.1	40	30	8,295	-33.7	
300	30	9,410	-39.4		30	9,155	-45.3		29	8,833	-52.0		29	9,127	-46.0		30	8,879	-51.6		31	9,335	-42.0		30	9,357	-41.8	
250	30	10,637	-47.4		28	10,352	-51.3		29	10,001	-55.8		29	10,324	-51.8		30	10,049	-55.5		31	10,546	-50.7		30	10,568	-50.8	
200	28	12,086	-56.5		28	11,787	-55.5		29	11,419	-55.6		26	11,750	-55.2		27	11,481	-56.4		31	11,977	-56.5		28	11,988	-58.1	
175	25	12,925	-59.8		28	12,635	-56.3		28	12,276	-55.1		25	12,599	-54.9		25	12,316	-55.4		30	12,814	-58.7		27	12,816	-60.3	
150	21	13,895	-63.1		28	13,610	-57.4		26	13,262	-53.8		25	13,581	-56.2		21	13,294	-54.3		30	13,777	-60.6		24	13,777	-61.6	
125	17	15,022	-66.8		26	14,759	-59.8		23	14,455	-53.7		23	14,733	-58.5		19	14,428	-53.8		28	14,909	-63.0		22	14,899	-63.0	
100	17	16,355	-71.0		22	16,146	-60.5		19	15,909	-53.6		21	16,126	-61.1		19	15,858	-54.9		27	16,270	-65.3		19	16,249	-65.2	
80	15	17,667	-71.3		21	17,522	-60.8		18	17,342	-54.2		15	17,516	-62.4		18	17,280	-56.4		25	17,643	-65.0		14	17,598	-63.8	
60	14	19,387	-67.0		12	19,335	-59.1		15	19,194	-55.5						13	19,129	-55.6		16	19,444	-61.7		12	19,367	-60.6	
50	13	20,508	-63.8		10	20,493	-58.0		15	20,357	-54.9						13	20,286	-56.5		12	20,596	-60.9					
40	13	21,888	-59.8		6	21,939	-56.9		12	21,811	-55.3						10	21,738	-56.9		11	21,994	-59.3					
30	8	23,690	-56.3		5	23,770	-55.9		7	23,617	-56.1						[illegible]	23,548	-55.9		9	23,808	-56.8					
20	5	26,289	-51.9																		5	26,433	-55.0					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

DECEMBER 1951

Standard pressure surface (mb)	HAVANA, CUBA (1013 MB.)				HILO, T. H. (1015 MB.)				INTERNAT. FALLS, MINN. (970 MB.)				JOLIET, ILL. (995 MB.)				LAKE CHARLES, LA. (1018 MB.)				LANDER, WYO. (823 MB.)				LAS VEGAS, NEV. (940 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	27	49	22.1	85	31	9	23.2	77	31	361	-13.9	80	30	179	- 4.7	80	30	5	13.1	84	31	1,696	- 6.2	59	31	660	5.7	53
1,000	27	164	22.5	81	31	136	22.3	77	31	126			30	137	-10.7		30	157	13.9	74	31	135			31	143		
950	27	615	20.2	79	31	583	18.9	80	31	523	-14.1	75	30	545	- 3.2	69	30	595	13.1	64	31	552			31	570	2.2	
900	27	1,075	17.3	75	31	1,043	15.7	81	31	929	-12.9	70	30	971	- 3.9	64	30	1,043	12.1	55	31	986			31	1,015	7.8	41
850	27	1,562	14.5	69	31	1,527	12.7	82	31	1,365	-12.6	60	30	1,421	- 5.1	61	30	1,521	10.8	52	31	1,437			31	1,484	5.1	41
800	27	2,073	12.8	53	31	2,035	11.3	67	31	1,827	-13.5	51	30	1,896	- 6.2	52	30	2,025	9.3	52	31	1,916	- 2.7	52	31	1,977	2.6	41
750	27	2,619	10.6	41	31	2,583	9.5	48	31	2,324	-15.2	50	30	2,407	- 8.0	48	30	2,565	7.2	45	31	2,430	- 5.2	49	31	2,504	0.1	40
700	27	3,187	8.3		31	3,143	7.1	40	31	2,835	-17.6	49	30	2,934	-10.1	46	30	3,124	4.8	41	31	2,964	- 8.4	50	31	3,047	- 2.6	36
650	27	3,804	5.6		31	3,753	4.1		31	3,394	-20.5	49	30	3,511	-12.9	47	30	3,729	1.4	37	31	3,541	-12.0	51	31	3,635	- 6.0	33
600	27	4,446	2.3		31	4,396	0.5		31	3,975	-23.6	46	30	4,108	-16.1	47	30	4,364	- 2.3		31	4,143	-15.9	50	31	4,253	-10.0	36
550	27	5,151	- 2.2		31	5,090	- 3.6		31	4,611	-26.7	46	30	4,765	-19.6	42	30	5,055	- 6.4		31	4,800	-19.8	45	31	4,923	-13.9	34
500	27	5,894	- 7.1		31	5,836	- 8.5		31	5,287	-31.2	46	30	5,461	-24.0	44	30	5,788	-11.2		31	5,494	-24.3	44	31	5,636	-18.7	30
450	27	6,717	-12.5		31	6,653	-13.7		31	6,028	-36.3		30	6,226	-29.2	41	30	6,596	-16.7		31	6,259	-29.5	43	31	6,420	-23.9	
400	27	7,598	-18.9		31	7,532	-19.4		31	6,832	-42.2		30	7,054	-35.0		30	7,463	-22.7	38	31	7,085	-35.3		31	7,264	-29.6	
350	27	8,578	-26.3		31	8,511	-26.4		31	7,723	-48.1		30	7,972	-40.9		30	8,428	-29.5	38	31	8,002	-42.0		31	8,203	-36.2	
300	27	9,674	-34.7		31	9,608	-34.1		31	8,725	-53.4		30	9,007	-46.9		30	9,510	-37.3		31	9,029	-48.5		31	9,257	-43.0	
250	27	10,922	-44.5		31	10,860	-43.3		30	9,896	-55.1		29	10,209	-52.3		29	10,741	-46.5		31	10,212	-54.0		31	10,468	-49.8	
200	27	12,379	-55.6		30	12,330	-53.5		27	11,319	-53.4		24	11,641	-55.8		29	12,187	-56.5		30	11,629	-55.6		31	11,908	-54.9	
175	27	13,218	-61.5		30	13,178	-59.0		26	12,182	-53.2		20	12,479	-55.8		29	13,025	-60.7		26	12,465	-55.0		30	12,752	-55.9	
150	27	14,159	-67.3		26	14,139	-64.8		26	13,175	-52.9		17	13,439	-56.6		28	13,976	-64.6		22	13,442	-54.4		29	13,728	-58.6	
125	23	15,247	-71.5		12	15,246	-71.1		24	14,341	-53.4		15	14,603	-57.9		24	15,068	-67.9		17	14,605	-55.1		29	14,865	-61.2	
100	12	16,546	-75.5		7	16,531	-75.8		23	15,762	-54.5		15	16,004	-58.9		22	16,390	-70.9		14	16,029	-56.7		27	16,244	-64.1	
80	5	17,801	-71.9						18	17,201	-53.9		12	17,398	-59.0		20	17,703	-71.3		12	17,447	-57.5		23	17,605	-63.7	
60	5	19,490	-68.1						15	19,060	-54.3		8	19,236	-57.4		19	19,423	-66.8		9	19,283	-56.5		20	19,385	-61.9	
50	5	20,601	-61.9						13	20,211	-54.9		8	20,389	-56.9		17	20,541	-61.8		8	20,438	-57.7		16	20,525	-60.0	
40	5	21,991	-58.7						11	21,613	-55.0		7	21,785	-56.8		13	21,946	-57.6		7	21,851	-56.5		13	21,922	-59.1	
30									6	23,578	-53.5						12	23,776	-53.6						8	23,751	-56.9	
20																	6	26,399	-49.6						5	26,308	-55.6	

Standard pressure surface (mb)	LITTLE ROCK, ARK. (1009 MB.)				MAZATLAN, MEXICO (1011 MB.)				MEDFORD, ORE. (970 MB.)				MERIDA, MEXICO (1013 MB.)				MIAMI, FLA. (1020 MB.)				NANTUCKET, MASS. (1017 MB.)				NASHVILLE, TENN. (998 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	79	6.3	71	28	14	23.1	79	31	401	2.4	90	31	27	24.4	77	31	4	21.4	78	31	14	2.7	77	31	177	6.1	71
1,000	31	149	5.6	65	28	109	23.7	75	31	153			31	144	23.9	76	31	174	21.4	75	31	153	3.1	72	31	159	0.1	
950	31	575	7.1	60	28	570	23.7	56	31	573	2.5	80	31	593	21.6	74	31	616	18.4	74	31	567	1.2	69	31	581	5.4	61
900	31	1,016	6.7	57	28	1,030	21.4	50	31	1,007	2.6	69	31	1,060	18.9	76	31	1,079	15.5	71	31	999	- 1.7	67	31	1,020	3.9	59
850	31	1,485	6.3	54	28	1,523	18.4	49	31	1,468	0.7	63	31	1,550	16.1	73	31	1,563	13.0	60	31	1,453	- 3.4	54	31	1,485	3.2	48
800	31	1,981	4.2	58	28	2,040	15.0	46	31	1,953	- 2.0	62	31	2,064	14.4	55	31	2,071	11.6	41	31	1,931	- 5.0	43	31	1,974	1.4	47
750	31	2,510	2.0	53	27	2,593	11.5	47	31	2,468	- 4.7	62	31	2,609	12.4	38	31	2,611	9.4	32	31	2,443	- 6.7	40	31	2,500	- 0.3	47
700	31	3,059	- 0.8	48	27	3,159	8.1	47	31	3,004	- 7.4	58	31	3,183	9.3	33	31	3,178	6.9		31	2,972	- 8.9		31	3,042	- 2.1	41
650	30	3,647	- 3.9	47	27	3,776	4.7	46	31	3,583	-10.5	52	31	3,797	6.5		31	3,787	3.8		31	3,547	-11.5	42	30	3,628	- 5.1	42
600	30	4,272	7.4	42	27	4,416	1.2	43	31	4,189	-14.4	51	31	4,446	3.1		31	4,428			31	4,153	-14.6	42	30	4,249	- 8.5	46
550	30	4,949	-10.6	35	27	5,117	- 2.8		31	4,849	-18.5	47	31	5,150	- 1.1		31	5,124	- 4.1		31	4,812	-17.9	35	29	4,923	-12.1	43
500	30	5,671	-15.4		27	5,860	- 7.2		31	5,548	-22.8	46	30	5,899	- 5.7		31	5,865	- 9.0		31	5,514	-22.3	35	28	5,644	-16.3	41
450	30	6,463	-20.3		27	6,684	-12.6		31	6,316	-27.9	45	30	6,729	-11.1		31	6,676	-14.6		31	6,286	-27.3		28	6,435	-21.6	40
400	29	7,330	-26.0		27	7,563	-18.5		31	7,149	-33.7	44	30	7,611	-17.0		31	7,554	-21.2		31	7,119	-33.2		28	7,287	-27.4	41
350	29	8,282	-33.0		26	8,546	-25.6		31	8,072	-40.0		29	8,599	-24.6		31	8,526	-28.1		31	8,043	-39.7		28	8,234	-34.2	
300	28	9,352	-40.7		26	9,645	-33.8		31	9,110	-46.1		29	9,700	-33.3		31	9,612	-36.6		31	9,083	-46.0		27	9,296	-41.2	
250	27	10,576	-48.7		24	10,898	-43.6		31	10,306	-51.7		28	10,953	-43.4		30	10,848	-46.4		30	10,280	-52.6		27	10,512	-49.3	
200	23	12,011	-55.7		18	12,372	-55.4		31	11,736	-56.3		21	12,417	-55.1		30	12,295	-57.2		30	11,706	-56.4		25	11,951	-55.8	
175	19	12,852	-59.0		15	13,229	-62.1		30	12,590	-57.4		18	13,250	-61.8		30	13,127	-62.9		28	12,569	-56.8		24	12,801	-57.1	
150	17	13,818	-61.8		12	14,162	-69.2		28	13,566	-57.5		18	14,188	-68.3		27	14,054	-68.1		27	13,538	-57.0		23	13,759	-59.4	
125	14	14,929	-64.6		11	15,235	-73.8		24	14,721	-58.8		15	15,266	-72.3		21	15,138	-72.3		25	14,694	-58.9		21	14,872	-62.5	
100	14	16,284	-66.4		7	16,528	-76.5		23	16,117	-60.6		10	16,561	-75.9		16	16,433	-74.6		20	16,078	-59.6		18	16,240	-65.4	
80	13	17,627	-65.4						18	17,498	-59.9		6	17,840	-78.9		14	17,727	-74.6		19	17,471	-59.6		14	17,609	-64.8	
60	11	19,400	-63.1						13	19,287	-60.1						13	19,428	-68.2		10	19,269	-59.3		13	19,371	-62.8	
50	8	20,534	-60.5						9	20,428	-59.8						13	20,535	-63.0		8	20,410	-57.9		12	20,487	-60.3	
40	7	21,962	-56.9						7	21,824	-59.2						12	21,928	-57.5		5	21,808	-56.6		11	21,886	-58.3	
30	6	23,788	-54.6														8	23,725	-54.6						8	23,732	-56.0	
20																	5	26,321	-51.3						6	26,332	-53.4	

Standard pressure surface (mb)	NORTH PLATTE, NEBR. (914 MB.)				OAKLAND, CALIF. (1018 MB.)				OKLAHOMA CITY, OKLA. (970 MB.)				OMAHA, NEBR. (979 MB.)				PHOENIX, ARIZ. (977 MB.)				PITTSBURGH, PA. (973 MB.)				PORTLAND, ME. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	849	- 5.7	77	31	6	9.3	77	31	391	4.0	63	31	308	- 6.0	80	31	338	10.7	66	29	382	0.8	72	31	20	- 4.0	84
1,000	31	136			31	158	9.6	71	31	136			31	139			31	140			29	160			31	141	- 2.0	76
950	31	550			31	585	7.4	68	30	564	5.6	56	31	548	- 4.9	67	31	576	13.8	45	29	577	1.0	65	31	553	- 2.4	73
900	31	973	- 5.0	67	31	1,026	5.4	62	31	1,001	6.9	43	31	969	- 4.4	66	31	1,027	11.1	41	29	1,009	- 0.1	61	31	976	- 4.5	71
850	31	1,423	- 4.0	58	31	1,491	3.5	55	31	1,469	5.9	35	31	1,420	- 3.6	60	31	1,501	8.0	42	29	1,464	- 2.2	60	31	1,425	- 6.2	67
800	31	1,901	4.3	57	31	1,981	1.4	48	31	1,963	3.9	31	31	1,898	- 4.7	55	31	1,998	4.9	41	29	1,944	- 4.2	55	31	1,898	- 7.8	62
750	31	2,417	- 5.7	54	31	2,506	- 0.7	40	31	2,491	1.1	33	31	2,410	- 6.6	50	31	2,528	2.1	39	29	2,458	- 6.0	55	31	2,403	- 9.6	54
700	31	2,947	- 8.6	56	31	3,048	- 3.5	38	31	3,037	- 1.9	34	31	2,940	- 9.3	53	31	3,075	- 1.1	38	29	2,989	- 8.7	51	31	2,929	-12.1	53
650	31	3,525	-12.4	58	31	3,634	- 7.0	36	31	3,628	- 5.0	33	31	3,519	-12.3	53	31	3,669	- 4.7	38	29	3,566	-11.5	46	31	3,497	-15.0	48
600	31	4,124	-16.3	56	31	4,250	-10.3		31	4,247	- 8.3	30	31	4,118	-15.8	52	31	4,289	- 8.2	35	27	4,178	-14.2	43	31	4,095	-18.0	49
550	30	4,778	-20.4	54	31	4,919	-14.5	36	30	4,919	-12.0		31	4,773	-20.2	51	31	4,965	-12.2	37	27	4,837	-17.6	44	31	4,744	-21.4	46
500	30	5,473	-24.7	53	31	5,630	-19.4	35	30	5,637	-16.5		31	5,469	-24.9	50	31	5,682	-16.6		26	5,542	-21.9	43	30	5,435	-25.4	46
450	30	6,236	-29.6	47	31	6,413	-24.8		30	6,426	-21.6		31	6,232	-29.5	48	31	6,469	-22.0		23	6.327	-25.8		29	6,203	-30.3	46
400	30	7,062	-35.4	44	31	7,253	-30.4		29	7,281	-27.4		31	7,059	-35.0	45	31	7,321	-28.5		23	7,167	-31.9		28	7,025	-35.7	
350	30	7,979	-41.7		31	8,189	-37.2		29	8,229	-33.9		30	7,984	-40.9		31	8,264	-34.6		23	8,098	-38.6		26	7,943	-41.9	
300	29	9,020	-47.8		31	9,238	-44.0		29	9,292	-41.1		30	9,019	-47.0		31	9,323	-41.8		21	9,172	-45.5		25	8,973	-47.7	
250	28	10,199	-52.6		30	10,445	-50.4		28	10,511	-48.6		26	10,215	-52.0		31	10,538	-48.7		20	10,360	-52.9		22	10,171	-52.0	
200	28	11,631	-54.7		30	11,882	-55.3		28	11,954	-55.4		19	11,641	-53.3		31	11,981	-55.0		19	11,797	-58.1		20	11,574	-54.4	
175	28	12,485	-54.8		29	12,731	-56.8		28	12,799	-58.2		19	12,498	-54.1		30	12,829	-57.5		18	12,645	-58.2		15	12,457	-54.5	
150	26	13,458	-55.1		28	13,702	-58.1		26	13,763	-61.3		16	13,488	-54.9		30	13,795	-60.2		14	13,616	-58.6		14	13,458	-55.2	
125	26	14,617	-56.6		26	14,838	-60.6		25	14,885	-63.7		14	14,673	-56.3		29	14,925	-63.3		11	14,781	-61.0		9	14,694	-58.5	
100	23	16,034	-57.5		23	16,219	-62.0		22	16,245	-65.6		11	16,109	-58.4		25	16,282	-66.0		10	16,162	-60.9		8	16,113	-59.3	
80	20	17,454	-57.4		21	17,597	-62.0		17	17,599	-65.2		8	17,566	-58.9		22	17,630	-66.5		10	17,551	-60.4		5	17,561	-59.5	
60	13	19,271	-58.3		21	19,374	-61.3		9	19,342	-63.1		5	19,401	-57.7		13	19,365	-62.2		7	19,365	-59.6					
50	12	20,434	-58.4		19	20,511	-60.9		6	20,498	-61.4						9	20,498	-61.1									
40	8	21,835	-56.0		15	21,910	-59.2		5	21,902	-59.1						8	21,884	-58.8									
30	5	23,673	-55.5		7	23,746	-57.7										5	23,671	-55.7									

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average monthly values

Table 20—Continued

DECEMBER 1951

Standard pressure surface (mb.)	RAPID CITY, S. DAK. (901 MB.)				ST. CLOUD, MINN. (976 MB.)				SAN ANTONIO, TEX. (989 MB.)				SAN JUAN, P. R. (1015 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	966	- 8.6	70	31	317	-10.7	77	31	240	12.6	64	31	19	24.2	84
1,000	31	139			31	124			31	149			31	150	24.1	80
950	31	546			31	528	-10.1	75	31	587	14.2	57	31	599	21.1	80
900	31	969	- 9.4	68	31	939	- 8.7	70	31	1,039	13.3	51	31	1,065	17.8	81
850	31	1,416	- 5.9	56	31	1,381	- 9.3	63	31	1,520	13.2	44	31	1,553	14.9	79
800	31	1,890	- 6.9	54	31	1,849	-10.3	57	31	2,027	11.5	38	31	2,065	12.5	69
750	31	2,396	- 8.8	54	31	2,354	-11.7	61	31	2,573	9.4	32	31	2,606	10.3	57
700	31	2,924	-11.3	52	31	2,870	-14.3	61	31	3,134	6.4	28	31	3,176	7.4	47
650	31	3,495	-14.2	50	31	3,439	-17.3	61	31	3,742	3.0		31	3,791	4.2	39
600	31	4,091	-18.2	49	31	4,025	-20.7	55	31	4,380	- 1.0		31	4,431	1.0	32
550	31	4,738	-22.2	47	31	4,668	-24.7	53	31	5,070	- 5.7		31	5,127	- 2.6	
500	30	5,433	-26.6	43	31	5,351	-29.0	53	31	5,809	-10.6		31	5,875	- 7.2	
450	29	6,187	-31.9		30	6,100	-34.0	51	30	6,622	-16.1		31	6,694	-12.5	
400	27	7,004	-37.7		30	6,911	-39.7		30	7,492	-22.3		31	7,577	-18.9	
350	27	7,912	-43.9		30	7,812	-45.5		30	8,459	-29.1		31	8,557	-26.1	
300	27	8,932	-50.5		30	8,827	-50.8		30	9,543	-37.1		31	9,653	-34.4	
250	27	10,107	-54.6		29	10,000	-53.0		29	10,778	-46.2		31	10,903	-43.8	
200	25	11,527	-54.7		28	11,440	-53.2		29	12,228	-56.1		31	12,367	-54.5	
175	22	12,402	-54.1		28	12,301	-52.8		28	13,064	-60.8		31	13,211	-60.1	
150	21	13,387	-54.0		28	13,294	-53.1		24	14,005	-65.0		30	14,159	-66.1	
125	18	14,558	-55.0		28	14,465	-54.4		21	15,104	-67.0		30	15,246	-72.3	
100	15	15,964	-56.8		25	15,876	-55.0		19	16,441	-69.2		29	16,542	-76.8	
80	11	17,370	-57.2		23	17,306	-55.3		18	17,766	-70.2		28	17,822	-77.5	
60	5	19,219	-57.7		14	19,208	-55.1		15	19,488	-65.5		22	19,499	-70.5	
50					7	20,450	-54.4		15	20,606	-61.4		10	20,590	-64.5	
40									15	22,003	-57.4					
30									12	13,836	-54.2					

Standard pressure surface (mb.)	SANTA MARIA, CALIF. (1010 MB.)				S. STE. MARIE, MICH. (987 MB.)				SPOKANE, WASH. (929 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	30	71	9.4	84	31	221	- 7.4	83	31	722	- 4.7	87
1,000	30	157	10.4	76	31	118			31	134		
950	30	591	9.1	63	31	523	- 7.4	77	31	545		
900	30	1,029	7.1	60	31	939	- 8.4	73	31	968	- 4.2	82
850	30	1,498	5.2	52	31	1,381	-10.3	73	31	1,418	- 4.2	77
800	30	1,991	2.6	48	31	1,846	-12.1	70	31	1,895	- 6.1	72
750	30	2,515	0.2	46	31	2,344	-13.9	57	31	2,402	- 9.0	67
700	30	3,061	- 2.2	41	31	2,860	-15.9	51	31	2,928	-11.8	61
650	30	3,648	- 5.9		31	3,419	-18.5	47	31	3,496	-15.3	56
600	30	4,269	- 9.4		31	4,009	-21.8	45	31	4,092	-18.9	52
550	30	4,939	-13.8	32	30	4,647	-25.6	45	31	4,736	-22.9	49
500	30	5,653	-18.8	31	30	5,331	-30.1	45	31	5,426	-27.4	42
450	30	6,435	-23.5		30	6,079	-34.8	48	30	6,165	-32.7	39
400	30	7,282	-29.8		29	6,891	-39.8		30	6,985	-38.2	
350	30	8,221	-36.4		29	7,792	-45.4		30	7,892	-44.0	
300	30	9,273	-43.6		27	8,800	-49.8		30	8,912	-49.8	
250	30	10,480	-50.4		26	9,991	-52.8		29	10,090	-54.3	
200	30	11,916	-55.8		22	11,435	-53.8		29	11,512	-55.2	
175	29	12,761	-57.5		19	12,304	-53.0		27	12,360	-54.3	
150	29	13,728	-60.4		19	13,297	-53.1		27	13,349	-53.9	
125	26	14,853	-62.4		17	14,453	-54.5		26	14,518	-53.7	
100	19	16,222	-65.2		16	15,872	-55.5		26	15,949	-54.5	
80	18	17,579	-65.1		11	17,318	-55.9		22	17,393	-55.1	
60	14	19,361	-63.1		9	19,211	-56.1		16	19,222	-55.4	
50	11	20,500	-62.3		8	20,376	-56.2		12	20,389	-55.8	
40	9	21,892	-60.3		6	21,812	-56.1		10	21,807	-56.3	
30												

Standard pressure surface (mb.)	SWAN ISLAND, W. I. (1015 MB.)				TACUBAYA, MEXICO (775 MB.)				TAMPA, FLA. (1020 MB.)				TATOOSH ISLAND, WASH. (1008 MB.)				WASHINGTON, D. C. (1010 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	31	10	25.6	80	26	2,306	15.3	47	31	9	17.3	84	31	31	4.9	81	31	88	3.0	72
1,000	31	140	25.7	77	26	103			31	181	17.9	77	31	98	3.9	79	31	168	4.4	64
950	31	592	22.5	78	26	536			31	625	16.7	72	31	519	2.1	78	31	588	3.2	61
900	31	1,060	19.2	77	26	1,015			31	1,079	14.9	65	31	950	- 0.2	75	31	1,023	1.9	59
850	31	1,550	16.1	74	26	1,508			31	1,562	12.7	57	31	1,405	- 2.5	69	31	1,483		56
800	31	2,064	13.7	64	26	2,037			31	2,069	10.6	49	31	1,884	- 4.4	63	30	1,971	- 0.9	51
750	31	2,606	11.4	52	26	2,591	15.0	42	31	2,612	7.9	42	31	2,397	- 7.0	58	30	2,491	- 2.4	51
700	31	3,180	8.9	39	26	3,163	11.2	44	31	3,170	5.4	36	31	2,925	-10.0	54	30	3,030	- 4.8	50
650	31	3,795	6.3		26	3,784	6.5	51	31	3,779	2.7		31	3,498	-13.5	47	29	3,617	- 7.8	49
600	31	4,442	3.1		26	4,429	2.1	45	31	4,416	- 0.9		30	4,102	-17.4	42	29	4,229	-10.9	45
550	31	5,146	- 0.9		26	5,134	- 1.1		31	5,110	- 5.1		30	4,751	-21.5	44	29	4,898	-14.6	42
500	31	5,896	- 5.7		26	5,881	- 5.8		31	5,847	-10.0		30	5,445	-26.3	45	29	5,608	-19.0	41
450	31	6,718	-10.9		25	6,706	-11.0		31	6,660	-15.3		30	6,202	-31.4	45	29	6,391	-24.1	40
400	31	7,606	-17.1		25	7,594	-17.0		31	7,531	-21.2		30	7,024	-36.9		29	7,232	-30.6	38
350	31	8,594	-24.6		25	8,580	-24.7		31	8,502	-28.4		30	7,937	-42.7		29	8,167	-37.2	
300	30	9,698	-33.2		21	9,655	-33.2		31	9,588	-36.7		30	8,962	-48.8		29	9,215	-44.6	
250	30	10,953	-43.2		17	10,938	-43.0		31	10,824	-46.2		30	10,145	-53.7		29	10,414	-52.3	
200	30	12,418	-54.7		14	12,413	-54.6		30	12,276	-56.7		29	11,573	-55.9		28	11,834	-57.0	
175	30	13,261	-60.6		11	13,246	-60.9		30	13,111	-62.2		26	12,411	-56.1		25	12,674	-58.5	
150	27	14,203	-67.0		8	14,181	-67.1		28	14,046	-66.8		23	13,415	-55.3		24	13,637	-59.6	
125	26	15,290	-72.4		7	15,291	-72.3		27	15,137	-70.1		22	14,572	-55.3		21	14,772	-61.0	
100	24	16,583	-77.8		5	16,560	-76.8		25	16,449	-72.4		19	15,959	-55.7		16	16,156	-61.6	
80	20	17,849	-79.6						22	17,753	-73.0		17	17,375	-55.8		11	17,551	-61.1	
60	15	19,506	-72.7						21	19,458	-67.1		12	19,183	-56.0		11	19,341	-59.9	
50	15	20,593	-66.1						20	20,567	-62.7		11	20,351	-56.0		11	20,482	-58.2	
40	14	21,966	-61.1						18	21,960	-57.5		8	21,737	-56.4		10	21,908	-55.6	
30	13	23,775	-56.5						18	23,789	-54.5						10	23,751	-53.2	
20	12	26,355	-52.6						10	26,394	-52.6									
15	8	28,217	-50.3						6	28,251	-51.0									

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Average monthly resultant winds

Table 21

DECEMBER 1951

Altitude (meters) m.s.l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)			Ely, Nev. (1,910 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	31	243	3.1	31	235	2.2	30	272	2.5	27	306	1.5	28	219	0.7	31	159	3.2	27	228	5.7	27	172	1.8	31	234	1.4	25	220	3.2	30	266	3.9	30	215	2.8
500	--	---	---	--	---	--	--	--	---	--	---	---	--	---	---	30	177	5.5	27	234	8.4	27	204	5.2	30	233	3.6	25	222	5.3	--	---	---	--	---	---
1,000	31	218	5.1	--	---	---	--	---	--	25	287	3.2	28	225	1.0	22	188	6.2	16	243	13.9	23	225	7.8	29	239	6.4	20	233	8.2	--	---	---	--	---	---
1,500	29	254	8.8	--	---	---	30	265	6.1	20	290	6.2	28	263	2.8	20	201	5.8				14	225	9.4	24	249	9.0	17	255	12.8	30	262	5.3	--	---	---
2,000	28	261	11.8	31	248	4.2	27	273	8.9	18	298	8.6	26	274	5.3	17	230	5.3				13	248	10.6	22	252	11.2	16	260	15.2	30	261	8.1	30	224	2.4
2,500	26	261	13.7	31	271	7.3	19	277	11.1	18	294	10.1	21	294	7.8	16	257	5.6							20	261	12.1	15	261	16.5	29	264	11.3	30	250	3.2
3,000	26	262	16.2	31	276	11.5	19	284	12.5	14	289	12.0	15	284	8.9	15	251	7.3							18	267	12.1	12	265	17.7	27	268	14.9	27	279	4.8
4,000	26	267	20.6	26	285	17.1	13	282	11.4	13	287	14.8	11	301	14.0	14	258	7.7							16	271	15.6				26	271	17.9	20	303	9.4
5,000	21	262	24.3	20	284	20.9	11	286	12.3	13	292	17.7				10	271	9.8							12	271	20.0				23	272	19.9	15	312	10.6
6,000	16	269	25.8	17	287	26.2	10	284	12.6																						20	267	22.6	12	318	15.2
8,000				15	284	26.7																									16	269	28.9			
10,000				11	284	29.0																									11	278	34.1			

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	30	312	2.0	28	261	1.6	29	249	2.6	28	13	0.5	27	222	3.7	26	203	2.0	20	288	1.1	30	116	3.6	30	143	0.8	29	209	1.1	26	248	1.7	29	224	3.0
500	--	---	--	28	241	3.6	--	---	--	28	178	1.1	27	231	5.8	26	211	4.3	20	294	1.1	30	108	4.0	28	189	2.2	29	205	4.2	26	304	1.4	29	228	3.3
1,000	--	--	--	26	240	7.8	29	258	5.4	25	214	4.0	23	247	8.1	22	228	7.0	20	255	1.5	30	114	2.9	21	255	2.8	23	220	7.2	21	343	5.1	28	226	6.3
1,500	30	304	2.4	23	255	10.0	27	273	8.5	22	240	6.4	21	270	11.2	19	260	11.3	15	258	1.6	29	153	1.9	17	282	7.9	21	243	9.2	21	336	6.2	26	250	8.5
2,000	30	269	1.6	21	264	12.1	23	283	9.4	19	239	6.9	19	270	13.1	18	274	14.7	12	261	2.2	26	191	1.4	13	281	9.8	18	261	12.6	17	341	6.9	24	257	11.6
2,500	27	237	3.9	20	267	15.6	21	290	11.1	16	241	8.0	15	271	16.1	17	274	17.2				26	228	1.8	11	283	15.5	18	269	15.4	15	341	7.9	23	260	14.2
3,000	25	249	6.5	18	269	18.4	15	283	12.0	16	249	10.2	10	275	18.5	15	278	20.1				26	242	2.0	10	277	17.8	13	266	16.9	15	359	8.2	21	264	15.9
4,000	16	287	12.2	14	271	24.4	14	291	14.5	15	255	12.8				14	276	24.6				24	255	5.4				11	262	21.0	13	344	12.4	16	273	20.3
5,000	10	295	13.3	12	272	29.2	13	291	17.0	10	277	15.5				10	268	29.2				20	262	7.6							12	351	15.8	14	271	25.6
6,000							11	281	18.2													19	259	10.5							11	357	18.6	10	271	27.6
8,000																						17	276	14.8												

Altitude (meters) m.s.l.	Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	28	297	1.4	31	63	0.1	29	343	4.1	25	299	2.1	25	202	2.5	31	159	0.6	30	257	2.4	24	236	0.5	27	188	2.1	19	194	1.1	28	276	1.7
500	28	288	2.1	31	90	.5	--	---	---	25	296	2.9	25	216	4.9	31	189	1.1	30	289	1.8	24	250	1.6	27	180	2.3	--	---	---	28	250	4.9
1,000	21	264	4.1	30	180	.4	29	340	4.2	20	296	4.8	20	230	8.1	29	222	2.7	29	296	1.8	18	233	3.5	20	209	3.5	19	207	1.2	27	259	8.9
1,500	18	292	7.9	30	217	2.1	29	296	7.3	19	298	7.0	18	250	12.8	24	257	6.7	26	301	1.4	13	236	4.0	10	253	1.7	13	255	4.6	26	270	10.7
2,000	[illegible]	291	11.5	28	242	3.5	20	281	9.4	18	301	10.0	17	261	13.9	24	258	8.3	24	296	2.8	12	270	5.5	10	319	2.8	11	253	6.7	25	274	12.9
2,500	16	290	14.8	25	259	4.5	18	288	11.3	16	308	13.6	16	258	17.5	24	258	11.0	21	290	2.2										24	277	15.6
3,000	14	296	18.3	23	272	5.7	16	272	11.1	16	307	15.5	14	263	21.2	23	253	13.8	21	269	2.8										23	273	19.6
4,000	12	296	25.2	20	280	8.6	11	276	11.7	15	298	19.1	10	274	22.0	21	261	17.2	17	295	5.3										19	273	22.7
5,000	10	296	28.1	18	283	12.8				12	295	22.8				18	265	20.0	15	304	8.3										15	271	23.9
6,000				15	277	17.3				12	294	25.7				11	261	20.2	14	298	9.9										11	268	21.2
8,000				10	277	19.0																											

These free air resultant winds are based on pilot balloon observations made near 2100 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°; W = 270°); speeds in meters per second.

RAWIN DATA

Average monthly resultant winds

Table 22

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)		
	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed
Surface	31	98	0.5	31	173	3.0	31	336	1.5	31	131	1.3
500	--	---	---	--	---	---	--	---	---	31	159	4.5
1,000	--	---	---	31	229	4.7	31	310	3.4	31	170	3.5
1,500	--	---	---	31	267	9.7	31	302	4.9	30	139	4.4
2,000	31	277	3.6	31	269	12.3	31	304	6.6	30	212	4.7
2,500	31	277	7.2	30	270	15.4	31	301	7.8	30	244	4.7
3,000	30	278	10.5	29	273	16.3	31	297	9.4	30	260	6.4
4,000	28	283	14.9	21	271	16.3	31	294	12.3	28	262	8.3
5,000	22	276	17.6	15	274	19.1	30	288	13.8	8	260	10.9
6,000	20	268	20.6	13	282	21.5	30	286	16.0	26	259	12.6
8,000							26	286	17.6	26	267	17.3
10,000							21	278	17.8	22	263	20.5
12,000							15	273	18.7	13	271	19.8
14,000							11	259	14.7			
16,000												

Altitude (meters) m.s.l.	Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)		
	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed
Surface	31	93	1.1	31	288	1.8	31	252	0.7	31	187	1.3
500	31	162	2.6	31	264	4.1	31	213	4.3	31	218	4.5
1,000	31	192	4.1	30	264	7.6	31	234	6.9	31	247	7.9
1,500	31	232	5.3	30	266	8.9	30	252	8.5	31	261	9.1
2,000	30	248	7.0	30	265	9.9	28	256	10.8	31	262	10.7
2,500	30	251	9.0	30	265	11.7	28	257	12.7	30	265	12.4
3,000	30	254	10.8	30	267	13.5	24	257	13.3	30	266	15.0
4,000	26	256	12.9	29	262	14.8	23	262	15.9	29	260	19.4
5,000	25	260	15.8	28	260	18.1	22	265	17.8	28	261	22.8
6,000	24	263	16.1	25	258	18.3	21	269	21.3	22	257	24.1
8,000	18	274	23.3	20	263	24.0	13	273	23.2	15	260	27.7
10,000	11	288	24.2	16	254	24.3						
12,000				15	263	21.8						
14,000				14	256	18.7						
16,000				11	247	16.3						

Altitude (meters) m.s.l.	Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)			International Falls, Minn. (358 m.)		
	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed
Surface	31	36	0.5	29	276	1.0	29	269	2.2	29	265	1.2
500	--	---	---	29	246	4.6	29	269	4.6	27	297	2.8
1,000	--	---	-	29	251	7.9	26	266	7.2	26	312	5.2
1,500	30	50	.5	28	262	[illegible]	27	262	8.8	25	306	7.0
2,000	30	198	1.3	25	269	[illegible]	27	264	11.3	25	300	8.5
2,500	30	228	4.6	24	268	15.8	26	260	15.1	24	299	9.8
3,000	31	251	7.2	23	271	17.9	26	263	17.0	25	294	9.7
4,000	31	271	12.6	22	269	19.8	23	265	19.7	24	284	10.5
5,000	30	273	18.2	18	268	22.7	20	264	19.3	26	278	13.5
6,000	25	273	17.9	16	266	23.4	19	266	22.7	25	281	13.8
8,000	17	279	19.0	14	270	29.9	14	280	25.6	19	263	16.0
10,000	12	268	24.8				11	289	33.1	12	264	21.4
12,000												
14,000												
16,000												

Altitude (meters) m.s.l.	Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)		
	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed
Surface	31	225	0.1	31	255	0.4	31	84	2.1	29	307	2.7
500	30	219	5.1	31	247	.7	31	103	4.9	28	286	7.7
1,000	26	256	6.7	30	231	2.3	31	102	4.3	28	273	9.1
1,500	22	273	8.8	30	245	3.7	31	124	3.0	28	270	11.3
2,000	19	266	11.0	30	265	5.4	31	165	1.8	24	272	12.9
2,500	18	263	12.6	31	284	7.2	31	225	2.1	24	273	16.3
3,000	18	268	13.6	30	290	9.0	31	252	3.8	22	271	18.1
4,000	16	258	20.4	27	300	9.8	31	259	5.2	19	273	22.0
5,000	12	275	19.6	22	308	12.2	31	262	8.8	17	267	24.0
6,000				19	317	14.0	29	273	9.6	12	276	21.3
8,000				15	318	16.6	29	280	16.3	12	271	23.0
10,000				10	287	16.0	27	286	20.1			
12,000							25	289	29.1			
14,000							17	285	24.4			
16,000												
18,000												
20,000												

Altitude (meters) m.s.l.	Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)		
	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed
Surface	30	205	1.5	31	286	0.5	30	176	1.8	30	336	1.8
500	30	212	5.7	31	304	2.6	24	199	3.1	--	---	---
1,000	28	222	8.6	31	312	4.1	22	241	7.3	30	333	3.9
1,500	27	246	9.6	31	309	4.7	20	270	5.6	30	310	7.4
2,000	27	257	12.7	31	309	5.9	20	257	7.5	30	306	8.9
2,500	20	265	12.5	31	307	7.3	19	265	10.2	30	296	10.6
3,000	19	270	16.2	30	304	7.9	20	272	13.0	29	297	11.4
4,000	14	273	20.3	28	303	10.3	21	272	17.3	29	291	14.3
5,000				25	303	11.8	20	277	22.2	28	286	17.1
6,000				23	306	13.2	14	268	25.0	27	278	19.8
8,000				17	317	20.6	11	268	31.1	23	277	22.6
10,000										16	274	24.0
12,000												
14,000												
16,000												
18,000												
20,000												

Altitude (meters) m.s.l.	San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)		
	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed
Surface	31	24	2.0	31	126	2.0	30	309	0.4	31	44	1.3
500	31	151	1.8	29	83	9.0	29	270	1.2	30	32	1.6
1,000	31	199	3.7	29	84	9.2	29	271	3.6	30	349	1.8
1,500	31	230	5.8	29	83	7.9	29	277	5.8	30	315	2.5
2,000	31	256	9.6	29	82	7.3	29	278	7.2	31	311	4.1
2,500	31	260	12.0	29	81	6.5	30	279	8.9	30	307	6.0
3,000	29	263	13.0	30	82	5.5	30	279	10.2	28	316	7.2
4,000	25	264	14.6	30	73	4.3	29	282	13.2	26	315	9.7
5,000	20	264	16.9	31	52	5.1	29	275	16.5	20	304	11.9
6,000	17	264	17.4	31	33	6.3	27	270	19.1	19	310	14.8
8,000	11	262	25.1	31	354	7.1	21	263	23.7	16	304	18.2
10,000				31	328	12.4	16	253	27.7	13	309	21.1
12,000				31	309	15.3	12	256	26.2	11	305	18.1
14,000				28	293	15.9	11	258	24.8	11	289	16.2
16,000				28	289	12.2						
18,000				25	323	5.0						
20,000				12	265	.9						

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)			Washington, D.C. (88 m.)		
	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed
Surface	31	135	0.8	30	176	1.5	29	113	1.8	29	241	1.3
500	31	219	1.5	--	---	---	29	219	1.5	29	251	6.7
1,000	30	250	4.1	28	205	3.5	29	263	3.6	27	268	9.5
1,500	29	267	5.8	28	240	5.9	28	284	4.5	26	271	10.9
2,000	28	261	8.0	28	260	7.4	28	285	6.6	25	271	12.3
2,500	27	259	9.2	28	280	8.4	27	293	7.9	21	272	14.6
3,000	27	260	10.8	29	290	10.1	27	299	7.9	20	264	16.4
4,000	26	257	13.2	29	299	12.2	24	294	10.8	17	254	19.7
5,000	19	258	15.6	29	299	16.4	21	299	11.9	10	270	19.7
6,000	16	259	15.2	23	288	14.5	18	295	14.6			
8,000	12	248	22.1	15	276	12.3	15	292	19.1			
10,000				13	300	15.9	14	303	19.0			
12,000							12	292	17.7			

These free-air resultant winds are based on rawin observations made near 0300 G.C.T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

Note: Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following table 3 in the January 1950 issue of the CLIMATOLOGICAL DATA, National Summary.

SOLAR RADIATION DATA

Table 30 -Solar radiation intensities tabulated in langleys per minute.

DECEMBER 1951

TABLE MOUNTAIN, CALIF.

Date	Sun's zenith distance, A M, 78.7°	75.7°	70.7°	60.0°	0.0°	P M, 60.0°	70.7°	75.7°	78.7°	Vapor pressure, EST, 7:30 a m	1:30 p m
	Air mass 3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
Dec.										Mb.	Mb.
9----	----	----	----	1.58	----	----	----	----	----		
10----	----	----	----	1.54	----	----	----	----	----		
14----	----	----	----	1.57	----	----	----	----	----		
15----	----	----	----	1.57	----	----	----	----	----		
17----	----	----	----	1.54	----	----	----	----	----		
20----	----	----	----	1.53	----	----	----	----	----		
21----	----	----	----	1.54	----	----	----	----	----		
22----	----	----	---	1.54	----	----	----	----	----		
Averages	----	----	----	1.55	----	----	----	----	----		
Departures	---	----	---	.00	----	----	----	----	----		

ALBUQUERQUE, N. M.

Date	Air mass 4.08	3.26	2.44	1.63	*0.82	1.63	2.44	3.26	4.08	7:30 a m	1:30 p m
Dec.										Mb.	Mb.
1----	----	----	----	1.46	----	1.45	1.34	1.21	1.10	2.3	3.0
2----	1.14	----	----	----	----	----	----	.88	.84	2.7	2.2
3----	1.16	1.27	1.39	----	----	1.54	1.40	----	----	2.2	2.3
4----	----	----	----	1.28	----	1.56	1.44	1.30	1.13	2.9	2.6
6----	----	1.20	1.39	1.54	----	1.48	1.34	1.26	1.10	2.1	1.6
7----	----	----	1.37	---	----	----	----	---	----	1.5	2.0
9----	.93	----	1.30	1.51	-----	----	1.22	1.12	1.03	2.3	2.3
10---	.88	1.06	1.13	1.43	----	1.38	1.17	1.04	.90	1.3	1.7
13--	.83	.90	----	----	----	----	----	--	----	2.5	4.6
14---	.80	.91	1.09	1.18	----	1.30	1.11	1.00	.86	4.0	1.7
15---	.94	.99	1.16	1.34	----	1.35	1.04	1.02	.92	1.3	1.5
16---	.94	1.06	1.20	1.38	----	1.39	1.24	1.06	----	1.3	1.7
17---	.88	.99	1.14	1.31	----	1.32	1.22	1.09	.94	2.7	2.7
18---	1.01	1.10	1.25	1.40	----	----	----	--	----	1.3	2.2
20---	----	----	---	1.35	----	----	----	.89	.87	3.0	1.4
21---	.99	1.12	1.21	1.34	----	1.37	1.14	1.03	.96	.7	1.2
22---	.98	1.10	1.21	1.39	----	1.43	1.27	1.12	1.05	1.1	1.8
23---	.94	1.08	1.21	1.40	----	1.24	----	----	----	2.0	2.7
25---	--	----	---	----	----	----	----	----	.96	5.2	5.6
26---	.88	.99	1.15	1.34	----	----	----	---	----	3.3	4.2
27---	----	----	1.16	1.32	----	----	1.13	1.02	.89	2.4	2.4
28---	----	---	----	----	----	----	1.28	----	----	3.2	1.0
Averages	.95	1.06	1.23	1.37	----	1.41	1.24	1.07	.97	---	---
Departures	-.06	-.05	-.01	-.01	--	+.02	-.01	-.07	-.09	---	---

TACUBAYA, D. F., MEXICO

Date	Air mass 3.83	3.07	2.31	1.53	*0.77	1.53	2.31	3.07	3.83	7:30 a m	1:30 p m
Dec.										Mb.	Mb.
1----	0.21	0.43	0.69	0.83	--	0.83	0.47	0.34	0.21	8.8	8.7
3----	--	----	---	.85	--	----	----	----	----	10.8	10.1
4----	---	----	----	.85	----	----	----	----	---	10.5	10.7
5----	----	.82	.71	.94	----	----	----	.91	.82	7.1	7.7
6----	.59	.73	.57	1.23	--	1.09	----	----	.54	6.9	3.7
7----	.39	.56	.82	.94	--	----	----	----	---	6.9	5.3
10---	----	----	.42	.88	----	.84	.84	----	----	8.5	10.0
11---	.31	.38	.40	.62	-	----	---	----	----	8.7	9.7
12---	[illegible]	.25	.57	.96	----	1.15	.87	.70	.71	8.5	9.9
13---	----	.68	.81	1.03	----	--	----	----	----	7.2	8.4
14---	----	.45	.48	.82	----	---	.72	----	----	9.9	9.7
15---	----	----	--	--	----	.67	.47	--	.20	10.4	10.8
17---	----	---	----	.77	----	----	----	----	----	7.6	8.1
19---	.64	.60	.67	.66	----	.51	.27	.22	.11	8.0	8.8
20---	.77	.91	1.09	1.12	----	----	.58	.81	.73	7.1	3.9
21---	.41	.57	.91	.87	----	----	----	---	----	6.5	4.8
22---	--	.34	.41	.61	----	--	--	--	----	7.9	6.3
24---	--	.65	.73	1.12	----	----	---	----	--	6.9	8.0
26---	----	.87	.96	----	----	----	----	----	----	7.4	6.9
27---	.63	--	----	1.17	----	----	---	----	----	11.3	9.3
28---	----	----	--	.72	----	----	--	----	----	7.7	8.5
29---	[illegible]	.66	.63	.93	----	----	----	---	----	5.9	5.3
31---	--	.10	.38	.89	----	----	---	----	----	6.1	5.3
Averages	.50	.56	.66	.90	-	.85	.60	.60	.47	----	--
Departures	-.06	-.08	-.07	.04	--	-.18	-.17	-.05	-.08	----	----

*Extrapolated

BLUE HILL, MASS.

Date	Sun's zenith distance, A M, 78.7°	75.7°	70.7°	60.0°	0.0°	P M, 60.0°	70.7°	75.7°	78.7°	Vapor pressure, E.S.T., 7:30 a. m.	1:30 p. m.
	Air mass 4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
Dec.										Mb.	Mb.
1----	0.62	0.80	0.95	----	----	----	0.79	0.65	0.57	6.0	6.4
3----	----	----	.99	----	----	----	----	----	----	5.2	5.6
4----	.76	.90	1.03	----	----	----	----	----	----	7.0	10.5
11---	1.01	1.10	1.21	----	----	----	----	----	----	2.2	5.0
12---	----	----	1.03	----	----	----	.82	----	----	3.4	3.3
13---	.85	1.11	1.30	----	----	----	----	----	----	2.0	1.4
16---	1.09	1.18	1.32	----	----	----	1.31	1.20	1.12	.5	.7
17---	.90	1.02	1.17	----	----	----	1.12	.97	.89	.8	.9
22---	----	----	----	----	----	----	.95	.80	.67	4.2	1.8
23---	----	----	----	----	----	----	1.07	.91	.81	1.9	2.2
24---	----	----	.96	----	----	----	.91	----	----	5.0	1.8
27---	.77	.91	1.17	----	----	----	----	----	----	2.0	1.3
28---	1.03	1.16	1.26	----	----	----	----	----	----	1.1	1.3
Averages	.88	1.02	1.13	----	----	----	1.00	.91	.81	---	----
Departures	-.03	-.02	-.03	----	----	----	-.15	-.12	-.14	---	----

RATIO BOSTON/BLUE HILL ON COMPARABLE DATES

	0.84	0.90	0.96	----	----	----	1.04	0.96	0.70	---	----

BOSTON, MASS.

Date	Air mass 4.96	3.96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96	7:30 a. m.	1:30 p. m.
Dec.										Mb.	Mb.
10---	0.81	1.04	1.17	----	----	----	----	----	----	4.4	5.3
11---	.58	.85	1.11	----	----	----	----	----	----	2.5	3.0
13---	.92	1.14	1.29	----	----	----	----	----	----	2.1	1.3
14---	----	----	1.10	----	----	----	----	----	----	1.8	1.8
17---	.81	.93	1.14	----	----	----	1.16	0.93	0.62	1.3	1.2
24---	----	----	.90	----	----	----	----	----	----	5.6	3.2
Averages	.78	.99	1.12	----	----	----	1.16	.93	.62	---	---
Departures	+.06	+.13	+.09	----	----	----	+.12	+.02	-.18	---	---

LINCOLN, NEBR.

Date	Air mass 4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77	7:30 a. m.	1:30 p. m.
Dec.										Mb.	Mb.
7---	0.86	0.99	1.12	----	----	----	----	----	----	4.6	4.4
11---	1.00	1.11	1.22	----	----	----	----	----	----	3.3	2.6
15---	1.04	1.13	1.24	----	----	----	1.27	1.13	1.04	.6	.6
21---	----	1.04	1.20	----	----	----	1.22	1.11	1.02	.5	.9
28---	----	----	1.09	----	----	----	1.06	.92	.76	2.2	3.3
Averages	.97	1.07	1.17	----	----	----	1.18	1.05	.94	---	---
Departures	+.03	.00	-.04	----	----	----	-.01	.00	.00	---	---

MADISON, WIS.

Date	Air mass 4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81	7:30 a. m.	1:30 p. m.
Dec.										Mb	Mb.
1----	0.49	0.60	----	----	----	----	----	----	----	6.1	7.5
4----	----	----	1.13	----	----	----	----	----	----	6.1	6.1
10---	.94	1.06	1.16	----	----	----	----	----	----	3.0	3.8
13---	1.04	1.14	1.28	----	----	---	----	----	----	.9	1.3
15---	.98	1.08	1.24	----	----	----	----	----	----	.8	.7
20---	.59	----	----	----	----	----	----	----	----	3.3	3.3
26---	.84	.91	1.13	----	----	----	----	----	----	2.0	2.2
Averages	.81	.96	1.19	----	----	----	----	----	----	---	---
Departures	-.08	-.06	+.02	----	----	----	----	----	----	---	---

Solar radiation intensities are expressed in gram-calories per minute per square centimeter of normal surface.

An explanation of Tables 30 and 31 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the Monthly Weather Review, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in Table 30 appears in volume 75, No. 3, March 1947, p. 47.

SOLAR RADIATION DATA

Table 31a.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass. during the month

Date	3	4	5	6	7	8	9	Average	10	11	12	13	14	15	16	Average	17	18	19	20	21	22	23	Average
Langleys	322	362	35	38	120	273	14	166	290	290	351	414	294	220	600	351	541	35	425	215	44	374	385	289
Date	24	25	26	27	28	29	30	31	Average															
Langleys	393	52	136	417	483	126	39	167	233															

Table 31b.-Daily totals and average daily totals by weeks of solar and sky radiation, plus the radiation reflected from the ground, as received on a vertical surface facing north at Blue Hill, Mass. during the month

Date	3	4	5	6	7	8	9	Average	10	11	12	13	14	15	16	Average	17	18	19	20	21	22	23	Average
Langleys	40	40	30	22	44	35	8	31	38	38	33	46	13	58	69	44	60	19	56	56	13	28	28	38
Date	24	25	26	27	28	29	30	31	Average															
Langleys	34	34	42	52	55	41	22	33	39															

Table 31c.-Daily totals and average daily totals by weeks of diffuse (sky) radiation as received on a horizontal surface at Blue Hill, Mass. during the month

Date	3	4	5	6	7	8	9	Average	10	11	12	13	14	15	16	Average	17	18	19	20	21	22	23	Average
Langleys	77	54	66	54	80	60	14	58	71	71	5	45	73	42	[illegible]	56	40	[illegible]	73	92	23	45	51	[illegible]
Date	24	25	26	27	28	29	30	31	Average															
Langleys	44	64	74	54	46	70	45	75	59															

Note.—Langley is the unit used to denote one gram calorie per square centimeter

SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface tabulated in langleys

1951	Albuquerque, N.Mex.	Amherst, Mass.	Apalachicola, Fla.	Atlanta, Ga.	Barrow, Alaska	Big Spring, Texas	Blue Hill, Mass.	Boise, Idaho	Boston, Mass.	Brownsville, Texas	Canton Is.,Pac.Area	Charleston, S. C.	Columbus, Ohio	Davis, Calif.	Dodge City, Kans.	E. Lansing, Mich.	E. Wareham, Mass.	Edmonton, Alberta	El Paso, Texas	Fairbanks, Alaska	Ft. Worth, Texas	Fresno, Calif.	Gainesville, Fla.	Grand Junction,Colo.	Grand Lake, Colo.	Griffin, Ga.	Hatteras, N. C.	Honolulu T. H.	Indianapolis, Ind.	Ithaca, N. Y.	Keflavik, Iceland	Lake Charles, La.	Lander, Wyo.	Las Vegas, Nev.	Little Rock, Ark.
December 3---	338		221	170		335	174	---	160	350	454	314	138	116	302	138	---	98	362	7	335	45		266	237	224	305	428	37	---	63	44	245	123	77
December 4---	323		345	320		142	193	---	159	231	628	92	87	29	143	111	164	103	(322)	8	114	33		186	175	237	182	446	224	91	50	377	229	116	202
December 5---	220		141	195		291	76	---	67	429	683	222	89	245	276	81	82	28	356	3	367	234		45	55	182	298	388	28	20	6	345	142	116	280
December 6---	348		225	---		288	63	---	(89)	373	662	273	188	232	287	86	68	101	185	15	313	166		280	143	97	194	336	190	127	3	116	176	282	125
December 7---	287		330	---		299	112	---	(107)	288	684	293	82	262	298	130	116	104	68	15	132	193		294	275	103	299	357	134	33	0	171	112	292	75
December 8---	256		307	---		215	147	---	152	116	594	271	28	241	271	24	86	105	389	7	130	220		273	266	87	264	281	37	164	3	166	245	290	41
December 9---	329		346	---		294	17	---	12	135	699	316	24	260	305	30	30	48	271	(3)	306	203		309	270	82	291	407	15	11	1	91	272	281	185
Averages------	300		273	---		266	112	---	(107)	275	629	254	91	198	269	86	91	84	(279)	(8)	242	171		236	203	144	262	378	95	74	18	187	203	214	141
Departures----	-6		+3	---		---	-22	---	+5	-51	---	+27	---	+32	---	+3	-40	+7	-49	+2	-5	-8		---	+15	-38	+32	+1	-50	-26	+4	-47	---	-26	---
December 10---	374		147	154		177	154	---	164	231	681	176	202	226	303	144	170	59	346	5	189	283		309	76	129	174	233	200	129	T	150	238	278	169
December 11---	315		67	---		312	162	---	143	385	661	47	50	212	284	75	203	30	251	(4)	369	277		297	113	154	22	315	71	80	5	375	194	270	289
December 12---	270		350	---		271	174	---	148	398	538	334	110	135	275	60	176	38	191	8	344	92		305	266	312	321	119	192	105	4	353	222	38	279
December 13---	174		339	290		97	192	148	207	305	691	259	220	229	74	133	202	57	161	5	171	89		155	37	286	326	214	198	179	4	118	214	225	179
December 14---	329		234	42		309	162	168	137	300	664	151	17	74	209	20	170	118	357	3	223	214		284	258	35	108	359	22	65	2	62	259	280	77
December 15---	328		42	---		351	115	100	118	104	710	67	145	53	312	137	81	71	359	10	383	79		219	100	261	42	260	224	83	7	390	249	272	305
December 16---	329		377	330		343	242	113	220	93	578	350	208	25	289	154	229	90	349	7	371	85		203	91	325	339	118	191	220	1	390	194	269	251
Averages------	303		222	204		266	171	132	162	259	646	198	136	136	250	103	176	66	288	(6)	293	160		253	134	214	190	223	157	123	3	262	224	233	221
Departures----	+5		-38	---		---	+30	-8	+39	-63	---	-16	---	-21	---	+10	+29	-4	-40	+1	+58	-8		---	-28	+17	-20	-132	+10	+10	3	+40	---	+4	---
December 17---	321		223	329		234	221	192	213	364	594	316	134	205	(227)	127	193	95	313	16	43	112		218	206	318	320	265	140	210	3	115	220	274	59
December 18---	284		152	239		299	34	69	31	84	705	39	111	85	(185)	94	24	36	350	2	289	94		147	169	213	(46)	331	118	36	1	289	84	171	292
December 19---	191		197	---		161	200	184	194	(336)	680	326	120	223	199	121	194	55	217	3	109	252		84	69	321	258	273	137	90	2	71	---	161	95
December 20---	270		148	22		155	142	114	116	222	568	45	17	244	112	34	128	63	349	2	309	283		273	185	16	42	438	13	50	2	[illegible]	---	283	78
December 21---	331		159	168		321	36	120	50	368	565	98	68	235	302	16	28	86	372	3	375	271		271	99	121	123	447	165	96	1	270	---	281	295
December 22---	326		354	332		303	165	234	162	408	609	211	230	207	280	144	103	99	361	4	352	264		235	170	318	130	456	215	147	1	393	---	278	301
December 23---	315		223	349		323	180	122	164	(301)	170	314	206	139	294	86	173	108	344	2	316	193		215	36	310	313	423	212	106	1	348	---	242	226
Averages------	291		208	240		257	140	148	133	(298)	556	193	127	191	(228)	89	120	77	329	5	256	210		206	133	231	(176)	376	143	105	2	232	---	241	192
Departures----	+16		-52	---		---	+3	+28	+23	-22	---	-20	---	+60	---	-6	-26	+13	+5	00	+13	+65		---	-26	+10	-17	-27	00	+4	-2	+9	---	+3	---
December 24---	136		312	---		241	182	217	177	---	199	288	182	133	80	121	157	97	210	4	227	225		220	78	261	242	438	118	94	7	121	---	212	109
December 25---	301		134	---		301	76	206	66	---	461	185	18	40	170	35	64	60	335	3	228	61		269	162	121	166	458	14	37	3	168	---	170	48
December 26---	312		179	---		334	113	85	110	227	257	67	148	65	164	165	92	47	341	2	365	258		164	(202)	93	54	430	116	85	3	232	---	264	263
December 27---	325		348	309		329	192	108	161	367	576	324	249	142	176	154	194	64	350	6	327	250		182	250	299	249	439	238	172	3	362	---	274	291
December 28---	274		344	312		293	214	94	184	397	672	297	84	29	273	62	203	49	332	5	335	41		254	138	300	262	249	119	115	2	355	---	269	191
December 29---	64		242	83		219	107	76	77	397	368	223	30	190	195	55	95	48	263	2	266	57		86	40	75	78	195	59	38	5	211	---	161	201
December 30---	159		320	172		201	55	182	48	410	697	217	23	195	151	68	61	82	157	3	214	90		33	22	174	173	112	26	19	1	194	---	114	218
December 31---	154		164	165		232	140	201	117	336	697	222	133	219	108	35	56	---	234	4	339	245		200	128	208	224	327	137	50	2	165	---	270	222
Averages------	216		255	208		269	135	146	117	356	491	228	108	127	165	87	115	64	278	4	287	153		176	(127)	191	181	331	103	76	3	226	---	217	193
Departures----	-30		-16	---		---	+6	+25	+10	+37	---	+27	---	-3	---	+5	-20	+9	-33	-1	+42	+12		---	-50	-14	-4	-49	-28	-23	-1	+10	---	-36	---

Accumulated Departures January 1 to December 31, 1951

	+740		-464	---		---	-260	---	+2922	---	---	---	---	+1572	---	-4447	-4052	---	---	---	---	---		---	+510	---	---	+1050	---	-37	---	+983	---	-3529	---

Note.--Langley is the unit used to denote one gram calorie per square centimeter. Values in parentheses are interpolated.

SOLAR RADIATION DATA

Table 33.—Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys —Continued

DECEMBER 1951

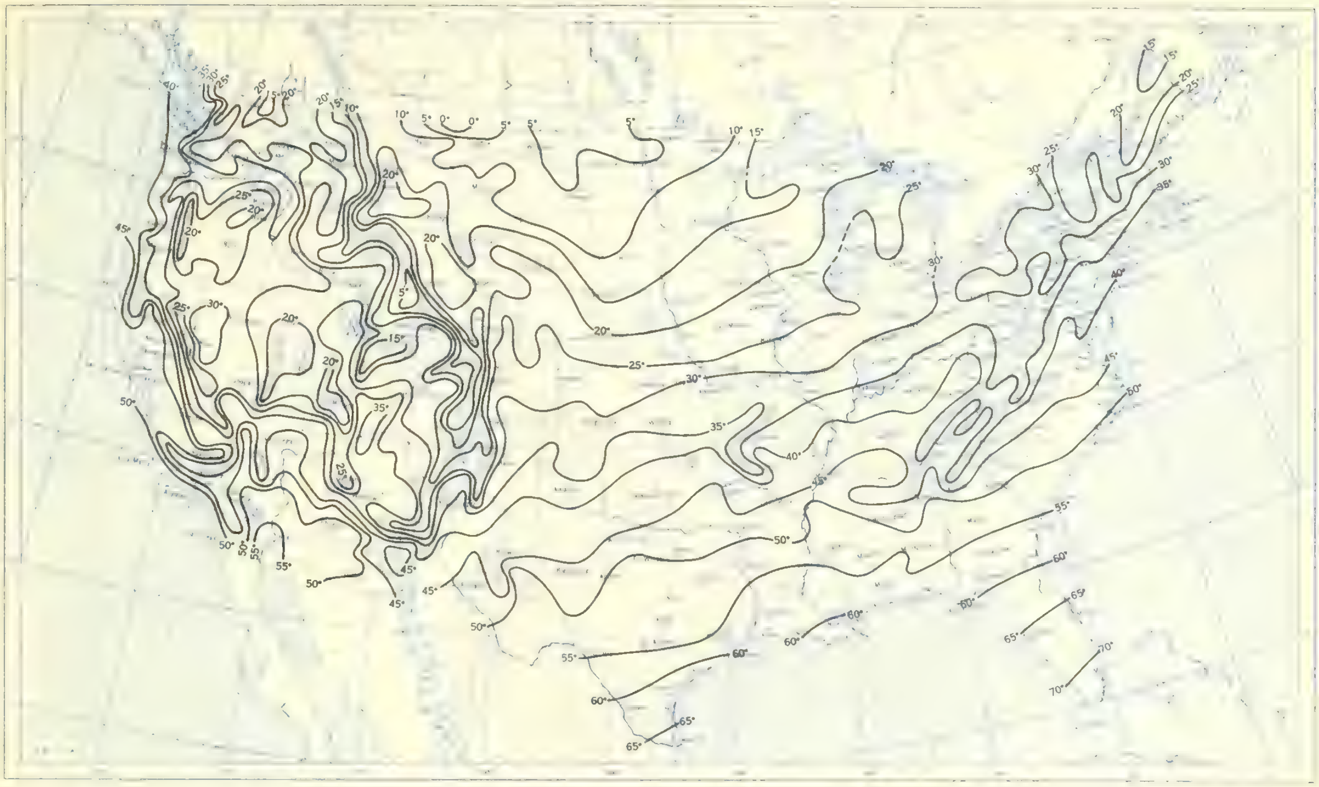
1951	Los Angeles, Calif. (WBAS)	Los Angeles, Calif. (WBO)	Lynn, Mass.	Madison, Wis.	Medford, Ore.	Miami, Fla.	Nashville, Tenn.	Newport, R. I.	North Head, Wash.	Oak Ridge, Tenn.	Ottawa, Ont.	Pearl Harbor, T. H.	Phoenix, Ariz.	Put-in-Bay, Ohio	Rapid City, S. D.	Riverside, Calif.	St. Cloud, Minn.
December 3---	196	172	111	28	77	300	170	224	88	220	144	493	277	210	185	194	
December 4---	195	160	139	197	47	233	224	174	26	197	81	492	342	87	117	242	
December 5---	278	298	32	80	103	329	147	98	108	141	29	421	160	134	62	283	
December 6---	137	143	77	38	145	374	106	60	---	194	77	270	340	137	84	200	
December 7---	336	293	60	31	140	324	49	126	68	148	68	330	119	103	86	344	
December 8---	294	251	124	32	216	341	58	110	43	168	50	345	336	72	187	304	
December 9---	322	283	T	64	210	407	39	32	69	(83)	44	371	343	48	191	296	
Averages------	251	229	78	67	134	330	113	118	67	(164)	70	389	274	121	130	266	
Departures----	---	---	-31	-49	+19	---	-25	-18	-3	-10	-69	+31	-21	+3	---	+40	
December 10---	314	273	91	186	193	362	26	168	---	68	168	284	335	184	154	300	
December 11---	43	70	87	88	63	335	222	136	---	231	69	334	322	51	98	94	
December 12---	213	118	113	81	38	(386)	187	179	155	71	166	140	79	74	107	166	
December 13---	310	258	164	204	25	431	259	233	160	273	159	225	152	96	106	299	
December 14---	304	268	93	52	49	414	---	154	---	14	101	332	311	14	126	308	
December 15---	307	269	80	225	76	260	---	149	54	200	139	184	326	77	129	311	
December 16---	268	262	174	200	117	112	---	241	106	300	217	106	328	255	194	292	
Averages------	251	217	114	148	80	(329)	173	180	119	165	146	229	265	107	131	253	
Departures----	---	---	+9	+27	-21	---	+45	+34	+42	+7	+21	-105	-23	+1	---	+40	
December 17---	297	244	125	58	57	187	---	220	20	278	201	249	317	207	283	308	
December 18---	170	162	1	195	69	293	---	20	40	202	48	310	277	112	283	211	
December 19---	284	134	196	57	104	366	---	202	---	198	191	250	104	176	159	195	
December 20---	292	262	94	107	60	366	---	112	61	21	53	446	336	29	99	312	
December 21---	304	278	23	99	50	309	249	33	24	264	71	458	333	75	179	312	
December 22---	293	251	118	174	39	413	274	132	108	323	131	509	328	180	111	294	
December 23---	240	235	126	171	64	396	257	192	162	280	161	300	256	166	204	255	
Averages------	269	224	98	123	63	333	---	130	69	224	122	360	279	135	148	270	
Departures----	---	---	-8	00	-26	---	---	-9	-3	+48	+11	-13	-8	+20	---	+55	
December 24---	187	185	125	106	78	312	124	179	95	234	124	456	93	182	135	183	
December 25---	180	164	64	56	131	400	18	70	149	93	38	449	302	10	197	130	
December 26---	295	261	78	223	30	396	19	107	51	132	199	430	321	219	165	298	
December 27---	233	197	116	192	23	236	273	217	117	293	199	413	311	222	172	279	
December 28---	81	64	136	131	54	338	231	213	74	266	142	225	243	59	132	81	
December 29---	12	21	53	133	59	407	50	78	---	28	76	179	76	82	94	31	
December 30---	168	121	9	156	196	434	130	39	---	---	147	114	51	74	88	45	
December 31---	328	276	138	61	120	310	265	147	---	---	---	409	265	66	106	320	
Averages------	185	161	90	133	99	354	139	132	97	174	139	334	208	114	136	171	
Departures----	---	---	-16	+15	00	---	+29	-3	+17	-10	+38	-28	-82	+5	---	-40	
Accumulated Departures January 1 to December 31, 1951	---	---	---	-4339	+2380	---	+7624	+2538	---	+4215	---	+6314	---	---	---	+9291	

1951	Salt Lake City, Utah	San Antonio, Texas	Santa Maria, Calif.	Sault Ste.Marie, Mich.	Sayville, N. Y.	Schenectady, N. Y.	Seabrook, N. J.	Seattle, Wash. (Univ. of Wash.)	Seattle-Tacoma, Wash.	State College, Pa.	Stillwater, Okla.	Swan Island, W. I.	Toronto, Ont.	Upton, N. Y.	Wake Island, Pacific Area	Washington, D. C. (WBCO)	Winnipeg, Manitoba
December 3---	128	135	51	65	251	172	207	64	36	186	216	511	95	198		(233)	24
December 4---	163	131	64	27	163	109	162	13	20	33	77	506	6	158		102	164
December 5---	91	379	299	78	41	37	55	74	41	36	264	(503)	144	(42)		116	42
December 6---	85	363	168	155	162	102	227	108	121	180	252	(499)	26	124		212	24
December 7---	231	150	342	18	194	94	222	97	(64)	127	264	(491)	57	184		179	66
December 8---	227	355	293	46	95	151	52	40	52	97	34	423	63	86		32	70
December 9---	247	190	343	45	35	9	66	29	42	41	294	477	42	34		61	61
Averages------	167	243	223	62	135	96	142	61	54	100	200	(488)	62	(118)		(134)	64
Departures----	+40	---	-23	-13	-12	---	-18	-1	---	-30	-16	---	-17	-21		-31	-52
December 10---	204	130	337	168	153	124	121	---	68	88	221	481	87	158		113	40
December 11---	168	272	173	62	221	85	118	---	28	84	269	396	44	120		129	74
December 12---	202	392	114	83	137	137	172	---	110	162	212	477	74	122		157	146
December 13---	107	240	278	146	224	163	189	---	137	158	93	499	136	162		200	121
December 14---	228	170	320	85	118	91	60	82	76	30	126	497	31	110		30	97
December 15---	136	---	323	106	210	178	205	20	29	136	258	342	151	189		227	133
December 16---	59	181	280	181	237	200	241	36	73	212	246	470	193	173		258	122
Averages------	158	260	261	119	186	140	158	--	74	124	204	452	102	(148)		159	105
Departures----	+27	---	+11	+19	+46	---	+13	--	---	+10	-7	---	+6	+17		+12	-3
December 17---	241	184	313	180	221	174	247	19	19	215	---	426	165	202		234	110
December 18---	43	176	175	159	12	28	14	42	29	81	244	(440)	15	(74)		24	122
December 19---	132	139	179	133	234	147	206	28	26	132	208	464	183	208		188	84
December 20---	89	318	322	67	45	58	51	20	19	38	77	(343)	14	36		24	106
December 21---	214	399	(308)	68	45	92	100	11	10	130	249	(468)	5	40		157	92
December 22---	33	403	320	123	168	111	198	90	126	208	209	(287)	126	152		238	92
December 23---	130	385	255	93	188	171	184	139	168	210	223	(372)	38	186		195	121
Averages------	126	286	(267)	118	130	112	143	50	57	145	202	(400)	78	(128)		152	104
Departures----	+21	---	+3	+4	-7	---	2	-5	---	+20	-8	--	-8	-7		+5	+1
December 24---	115	145	302	146	185	149	235	72	63	211	78	(489)	160	177		236	---
December 25---	144	209	188	137	99	60	74	145	68	35	221	(362)	9	77		65	---
December 26---	116	378	296	90	166	136	125	36	39	137	246	494	126	97		169	---
December 27---	178	406	167	144	252	180	212	64	55	234	[illegible]	512	124	214		231	---
December 28---	41	344	88	50	175	155	172	24	23	87	212	479	25	(160)		146	---
December 29---	37	389	50	36	98	46	141	66	72	64	231	471	73	90		124	---
December 30---	143	361	127	157	41	26	30	90	100	31	109	(497)	77	40		53	---
December 31---	230	369	320	10	157	66	147	131	133	39	130	493	15	162		166	---
Averages------	126	325	192	96	147	102	142	79	82	115	184	(475)	87	(127)		149	---
Departures----	-12	---	-76	-17	+16	---	-2	+21	---	5	-24	---	-3	-8		-2	---
Accumulated Departures January 1 to December 31, 1951	+961	---	-2309	---	+1829	---	+2070	---	---	+2291	---	---	-388	+5571		---	---

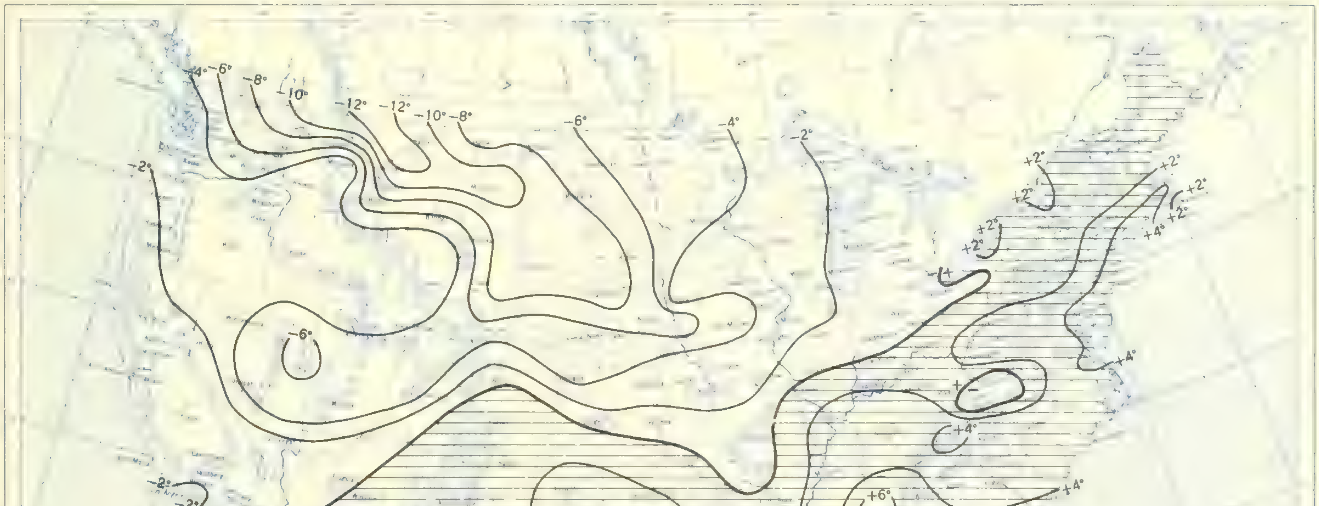
Note.--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

W. R. P. C., Chattanooga, Tennessee --- [illegible] --- 2200

Chart I. A. Average Temperature (°F.) at Surface, December 1951.

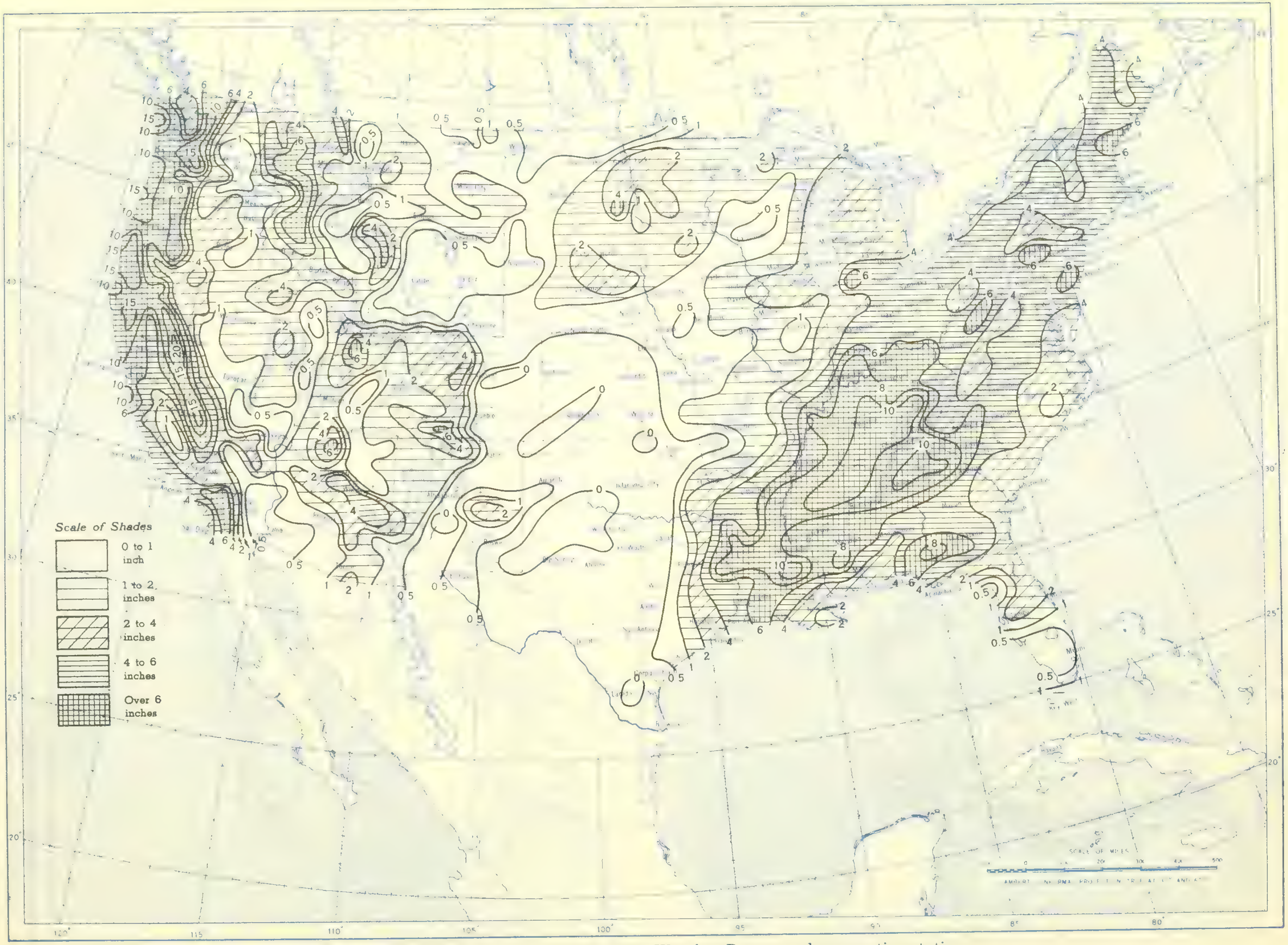


B. Departure of Average Temperature from Normal (°F.), December 1951.



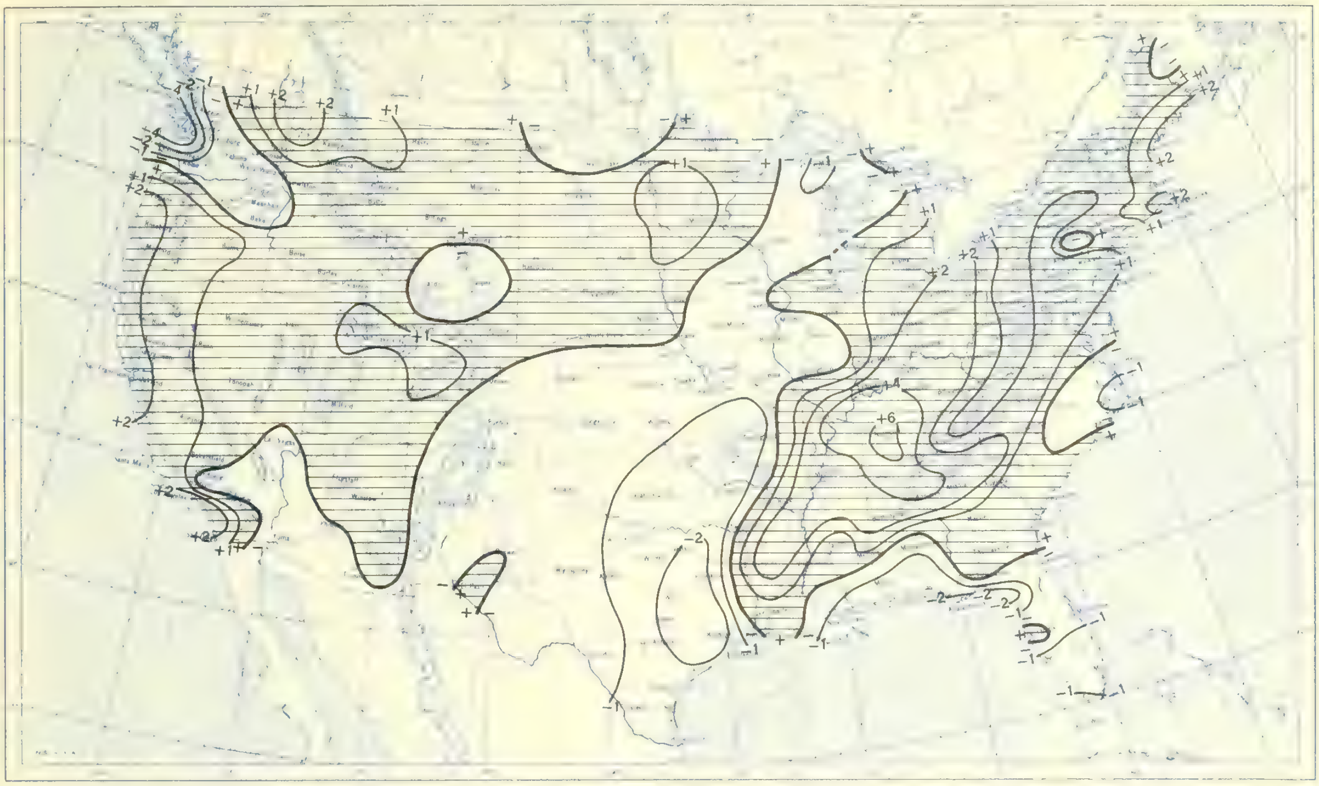
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), December 1951.

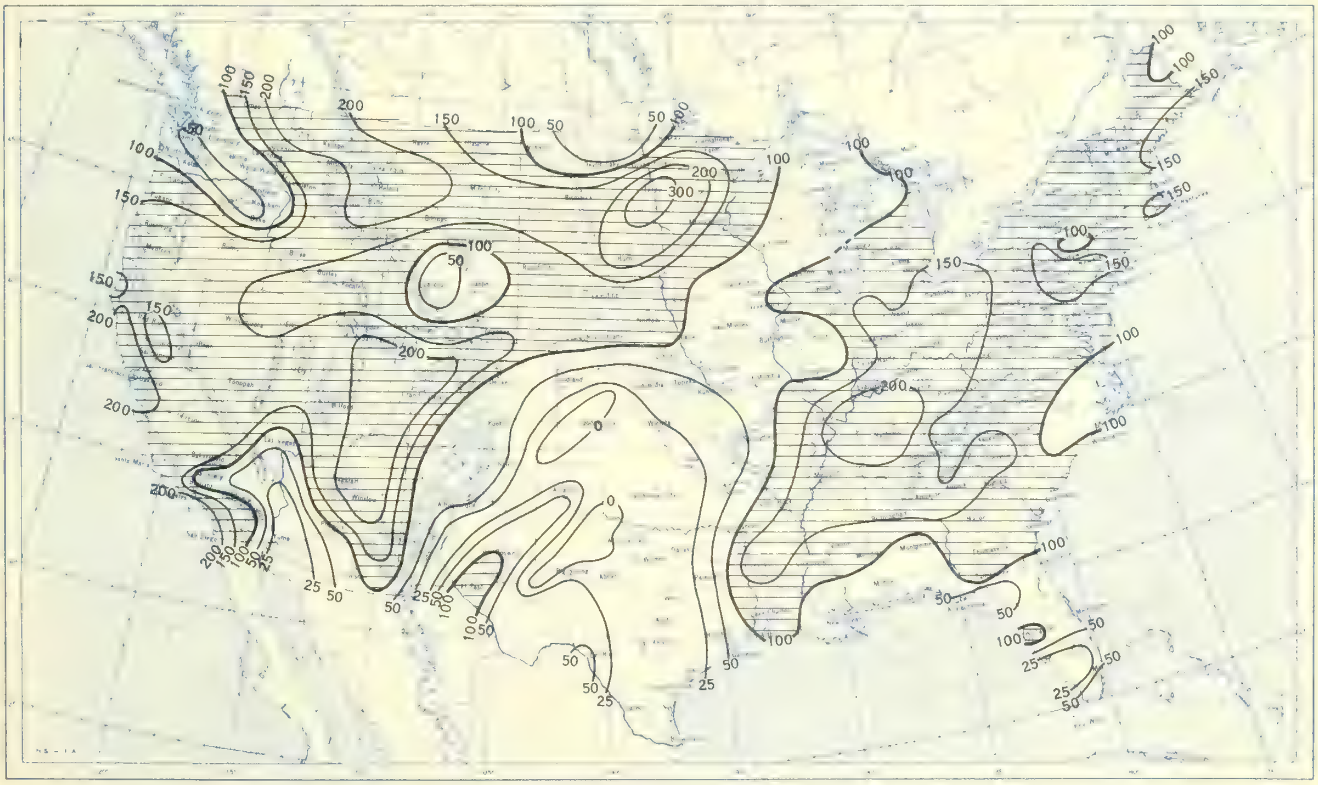


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), December 1951.

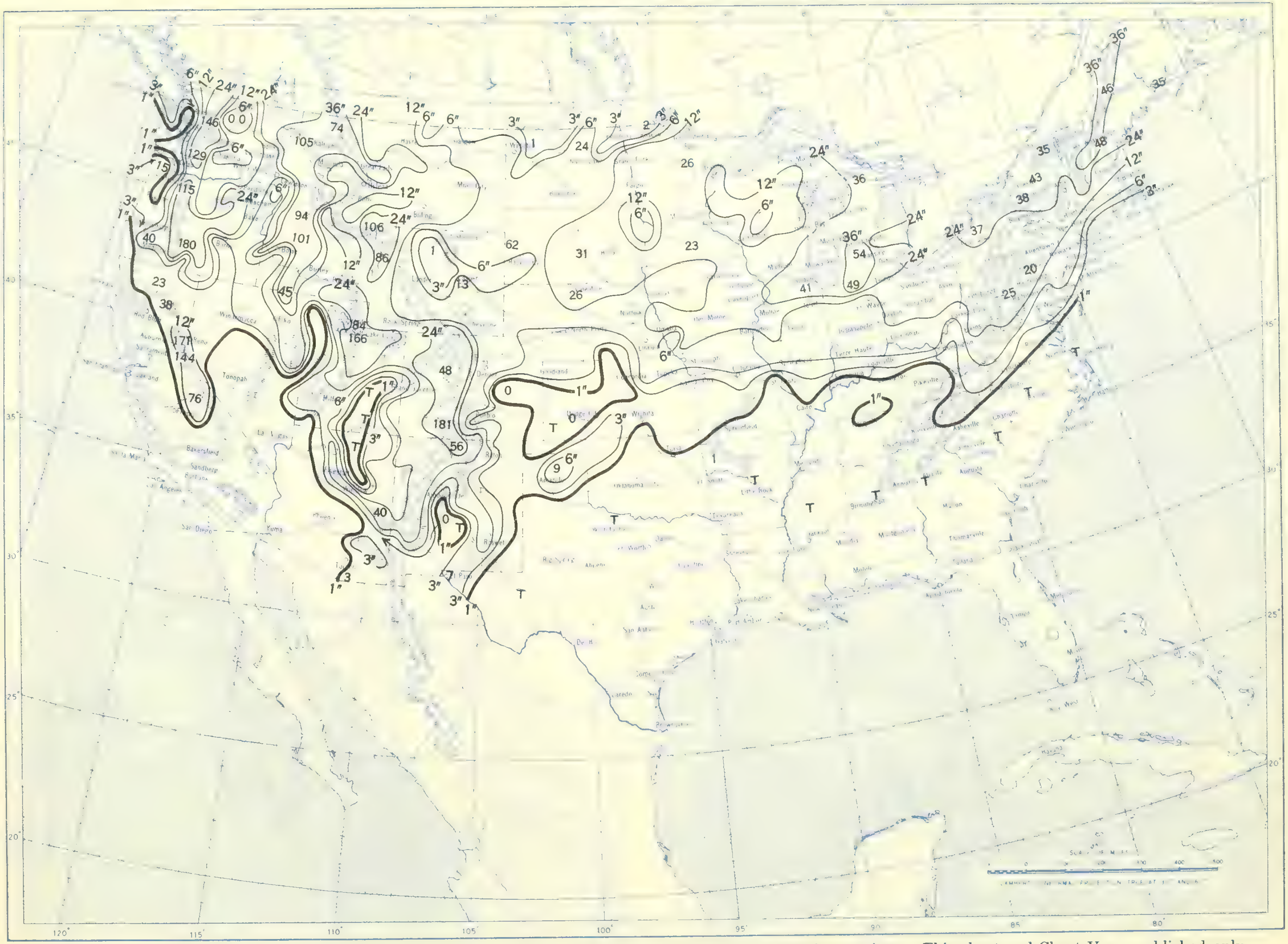


B. Percentage of Normal Precipitation, December 1951.



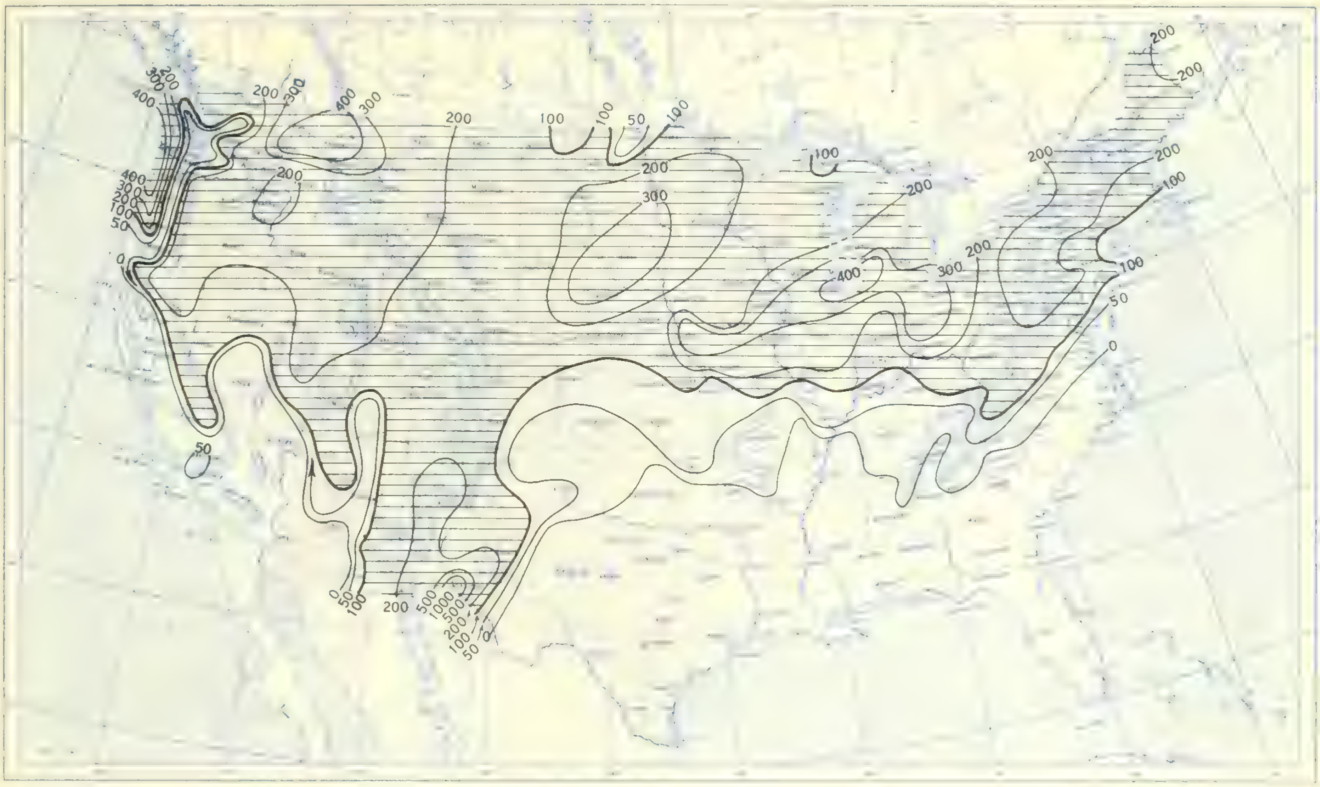
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), December 1951.

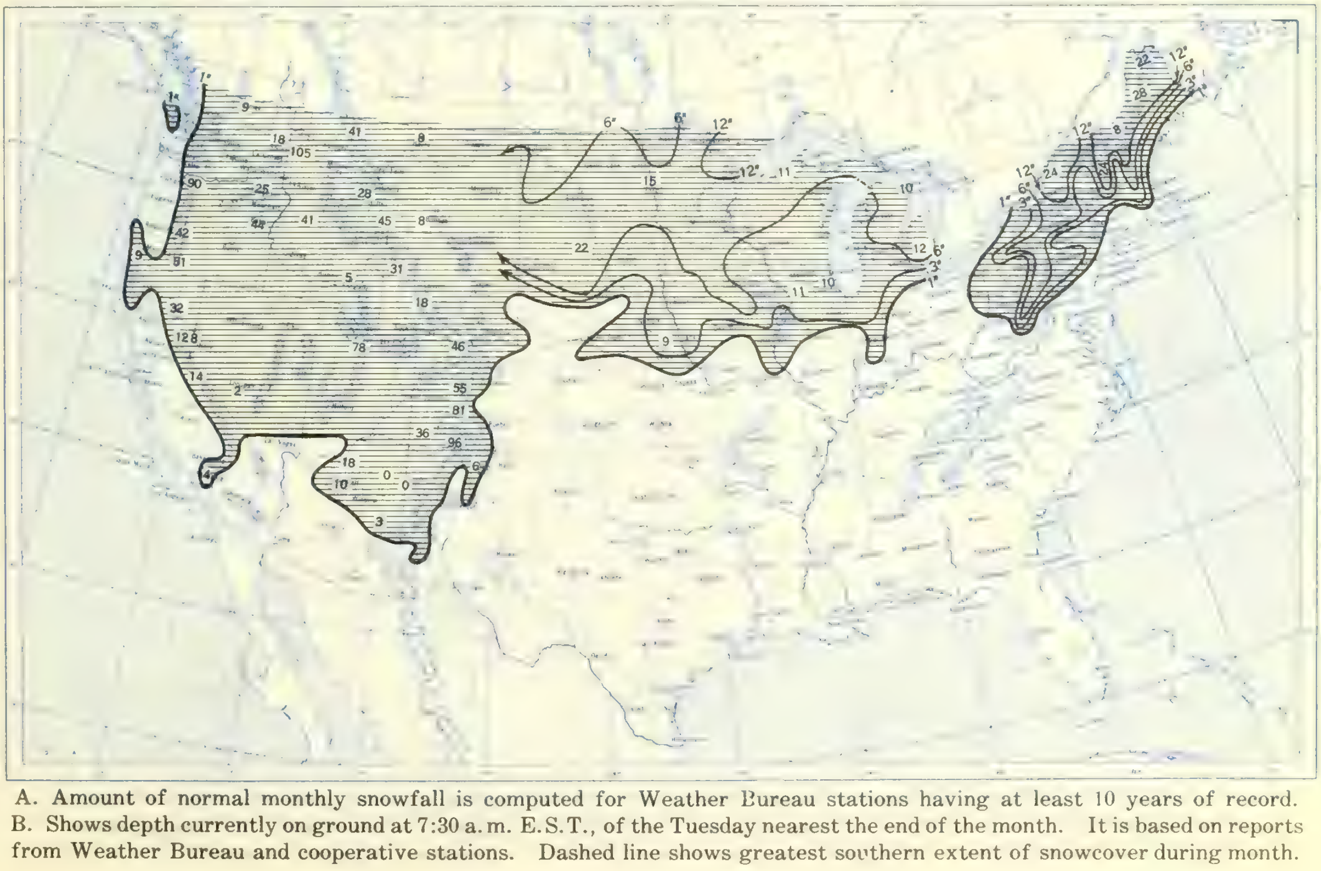


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, December 1951.

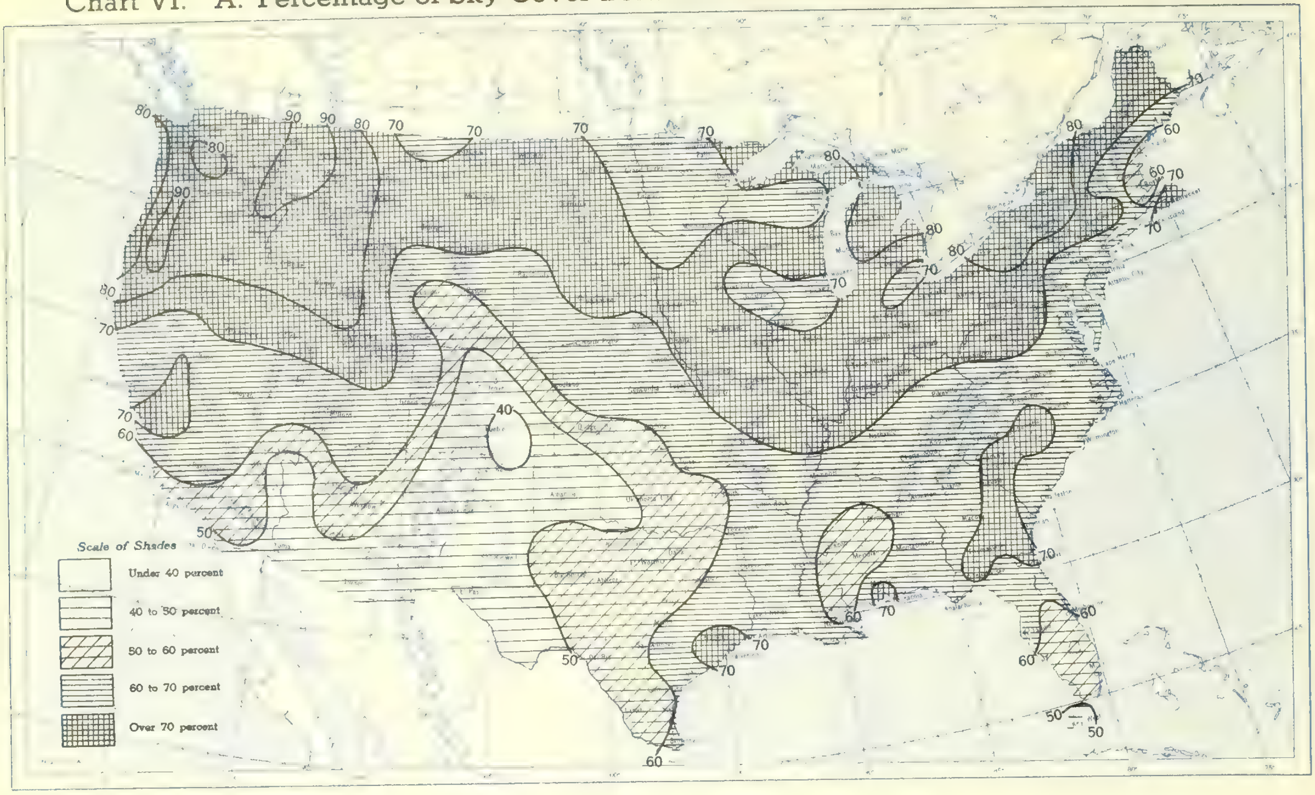


B. Depth of Snow on Ground (Inches), 7:30 a. m. E. S. T., January 1, 1952.

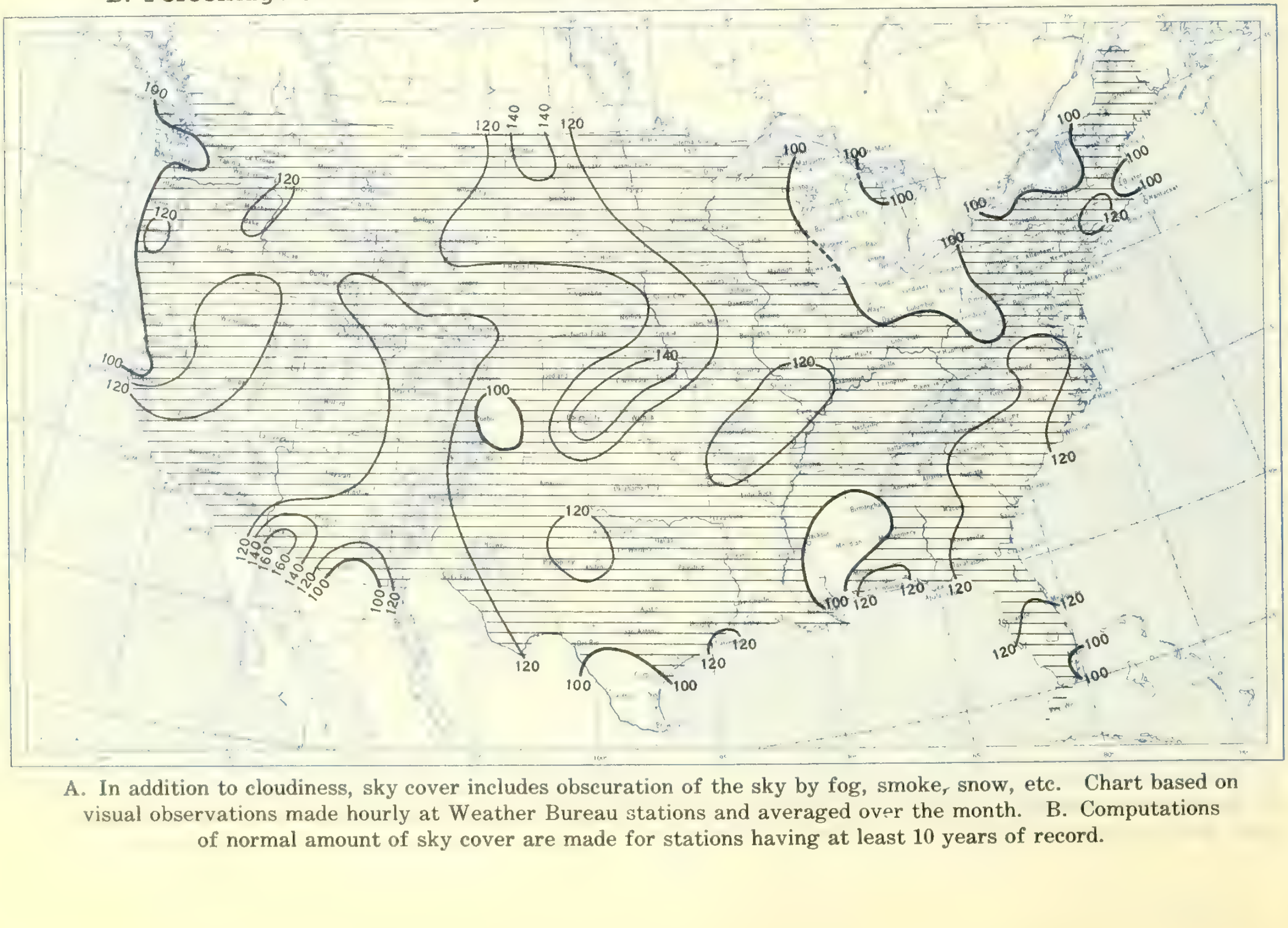


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, December 1951.

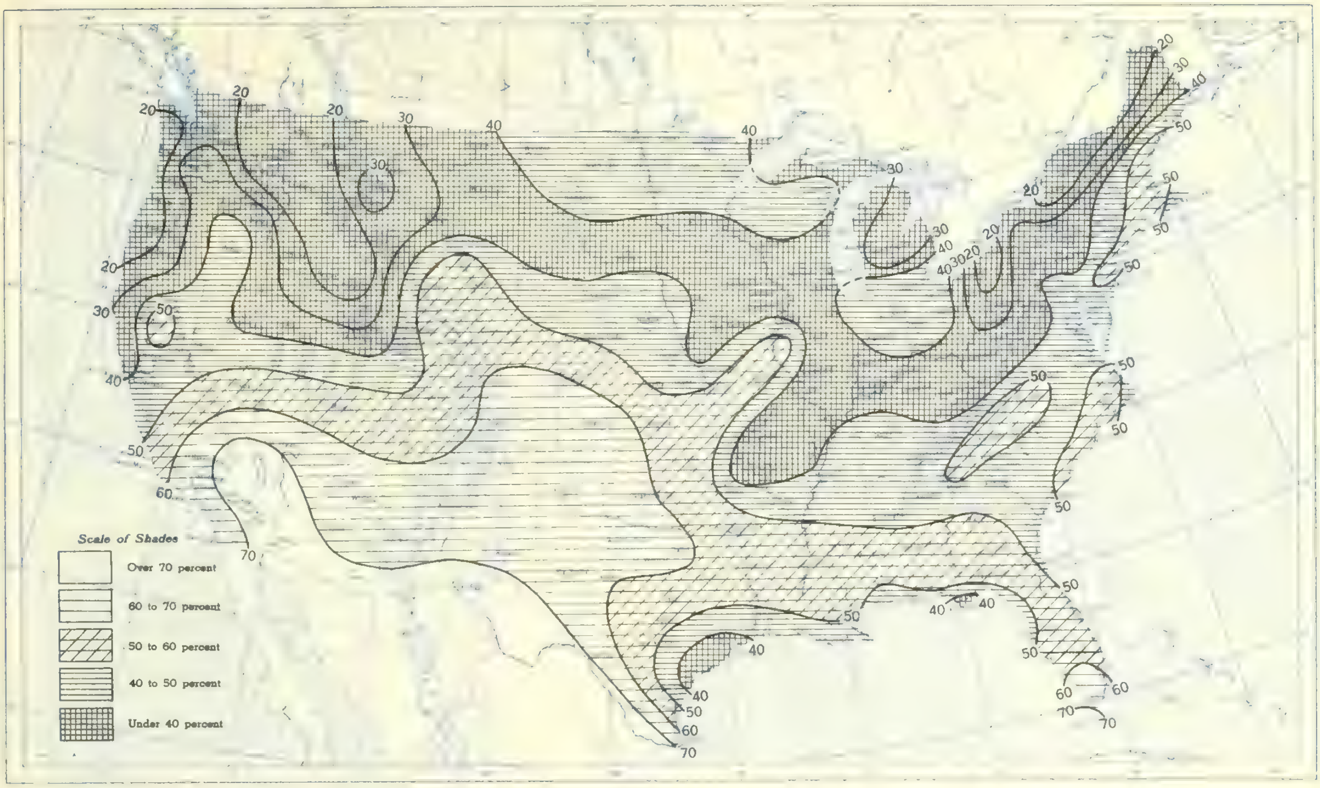


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, December 1951.

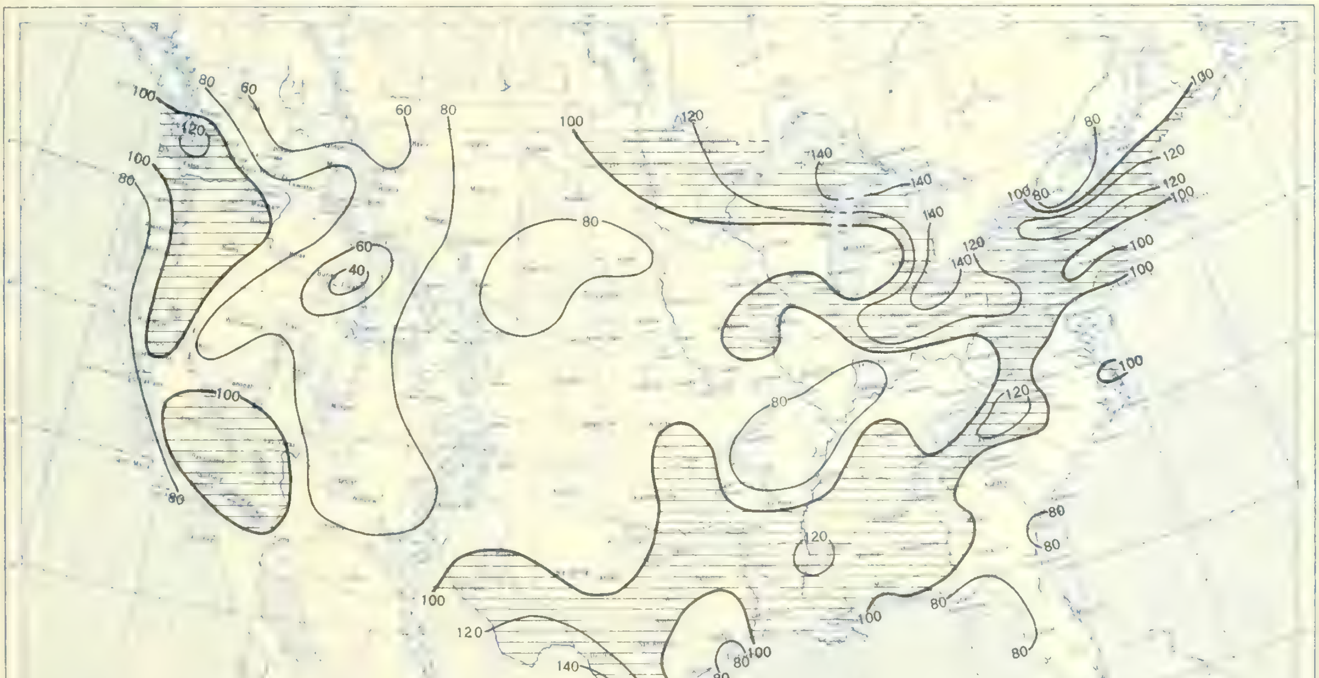


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, December 1951.



B. Percentage of Normal Sunshine, December 1951.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, December 1951. Inset: Percentage of Normal Average Daily Solar Radiation, December 1951.

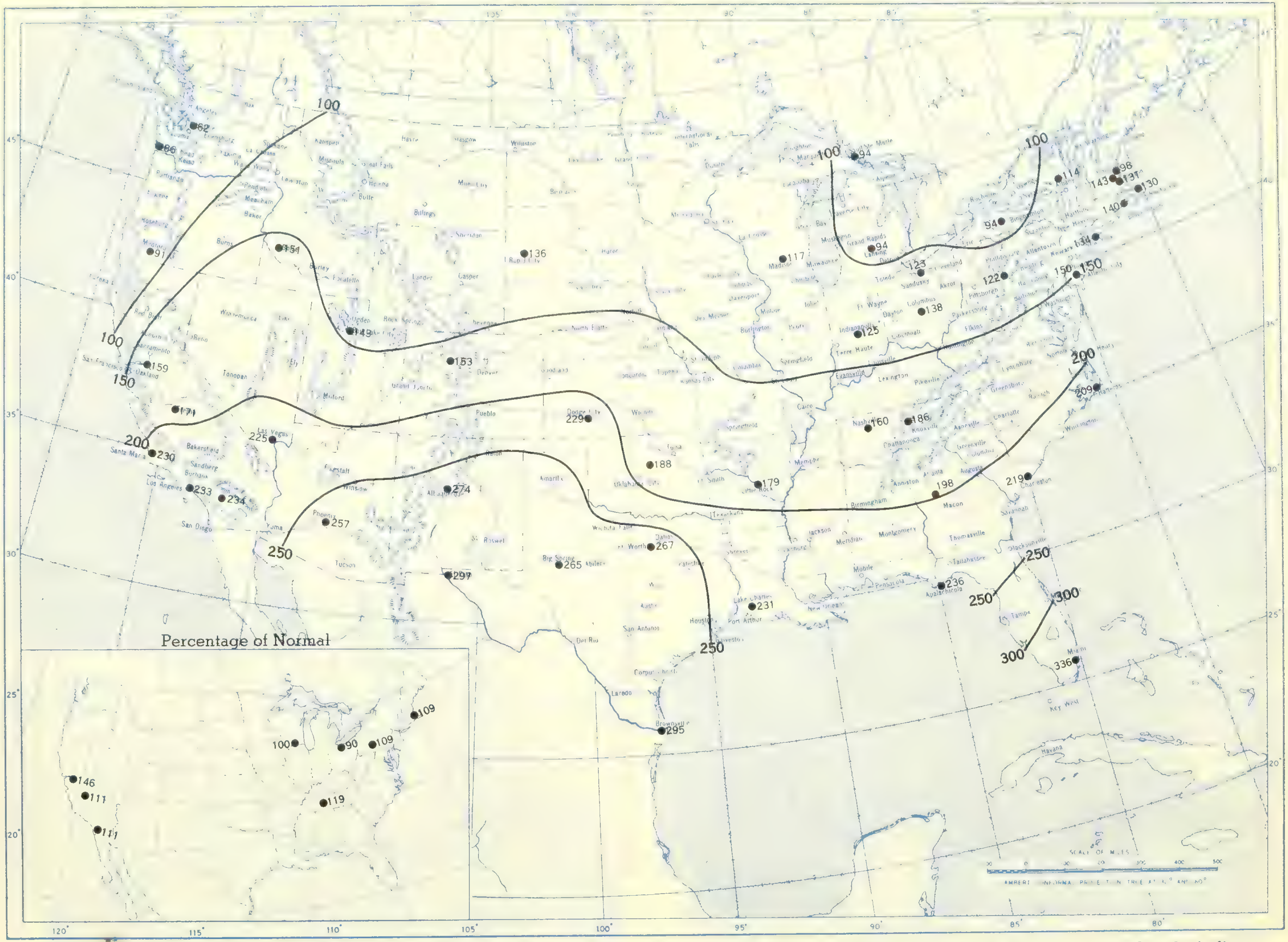
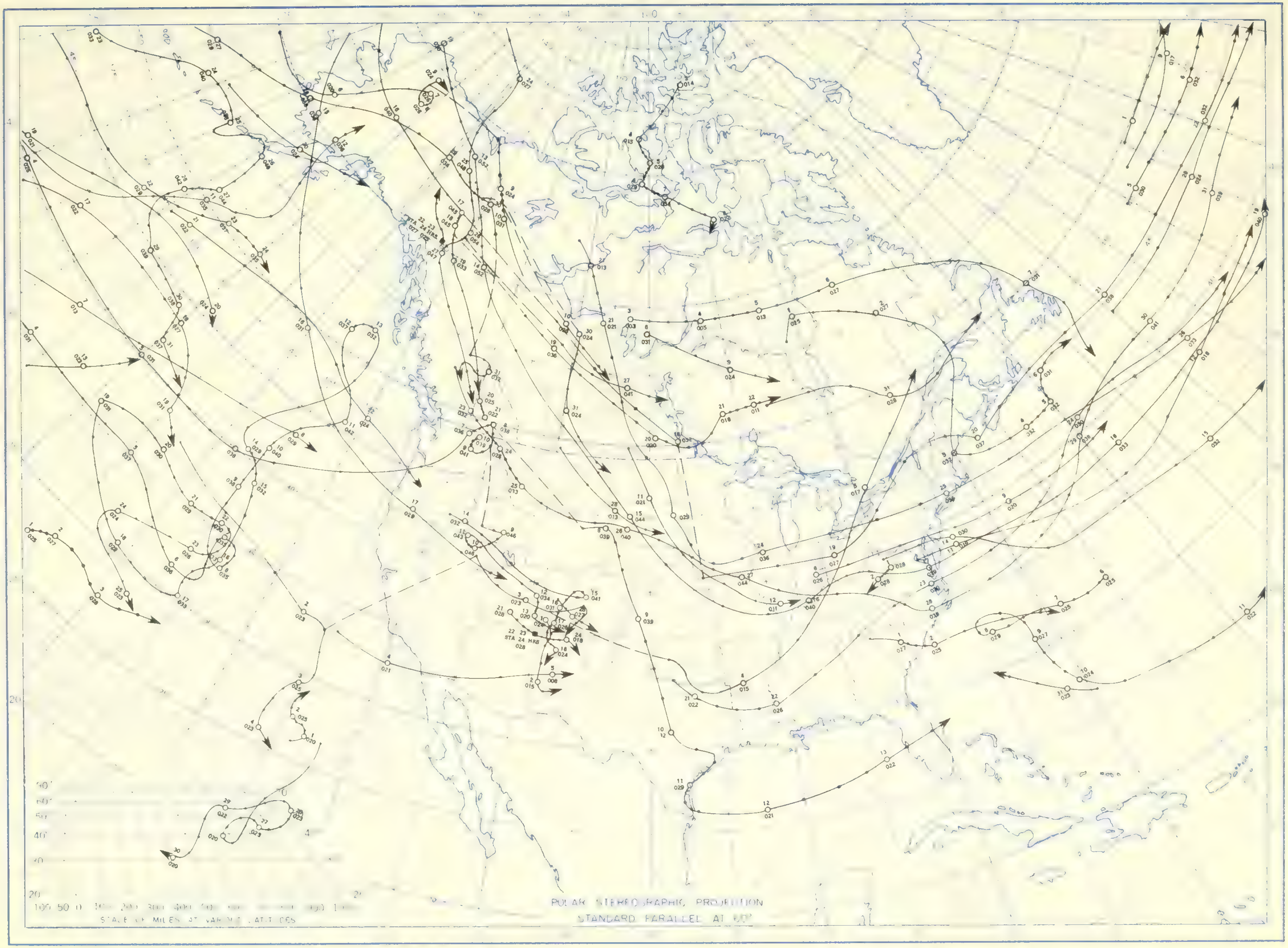


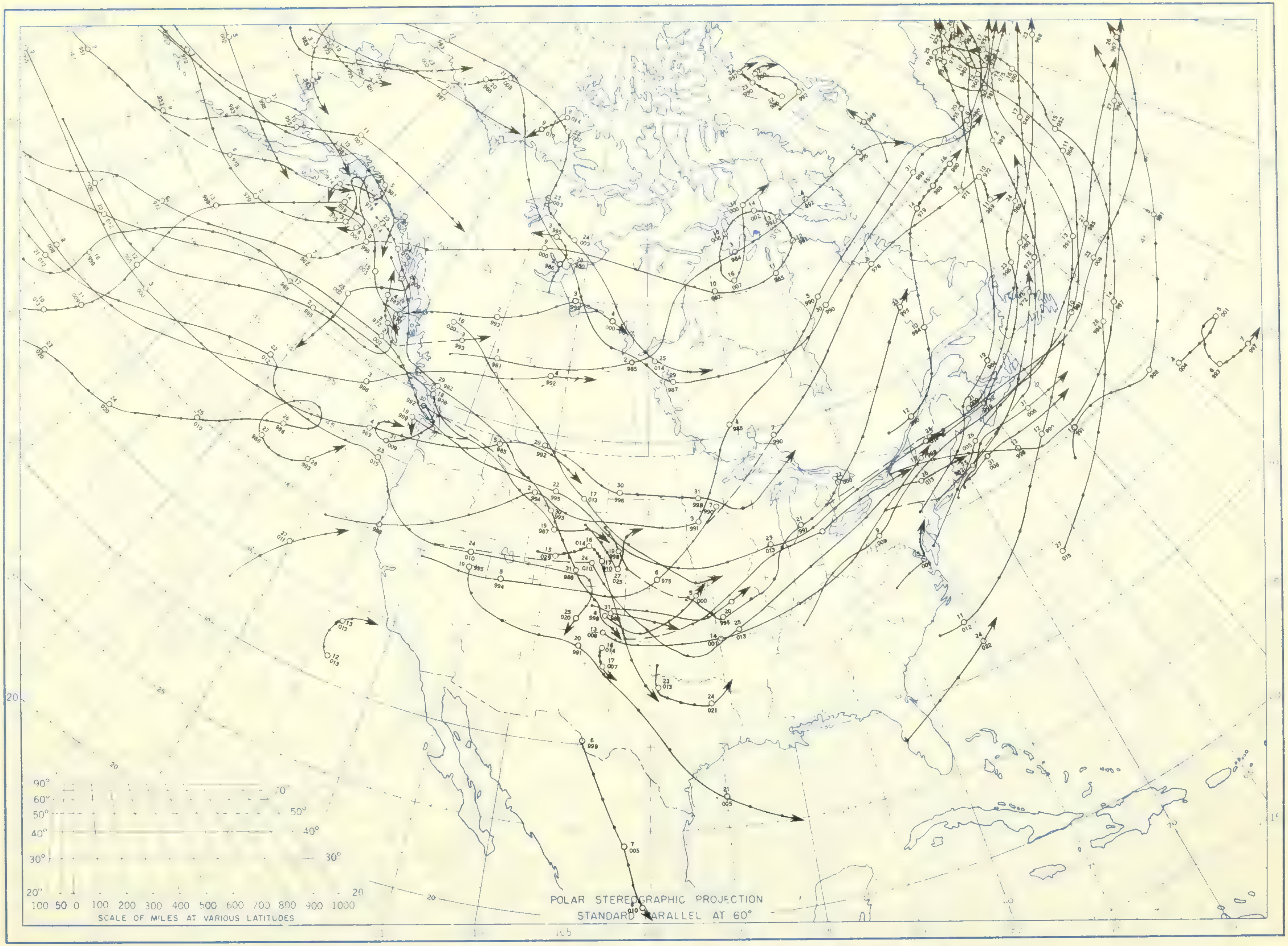
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm. $^{-2}$). Basic data for isolines are shown on chart. Further estimates obtained from supplementary data for which limits of accuracy are wider than for those data shown. Normals are computed for stations having at least 9 years of record.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, December 1951.


POLAR STEREOGRAPHIC PROJECTION
STANDARD PARALLEL AT 60°
SCALE OF MILES AT VARIOUS LATITUDES
STA 24 HRS

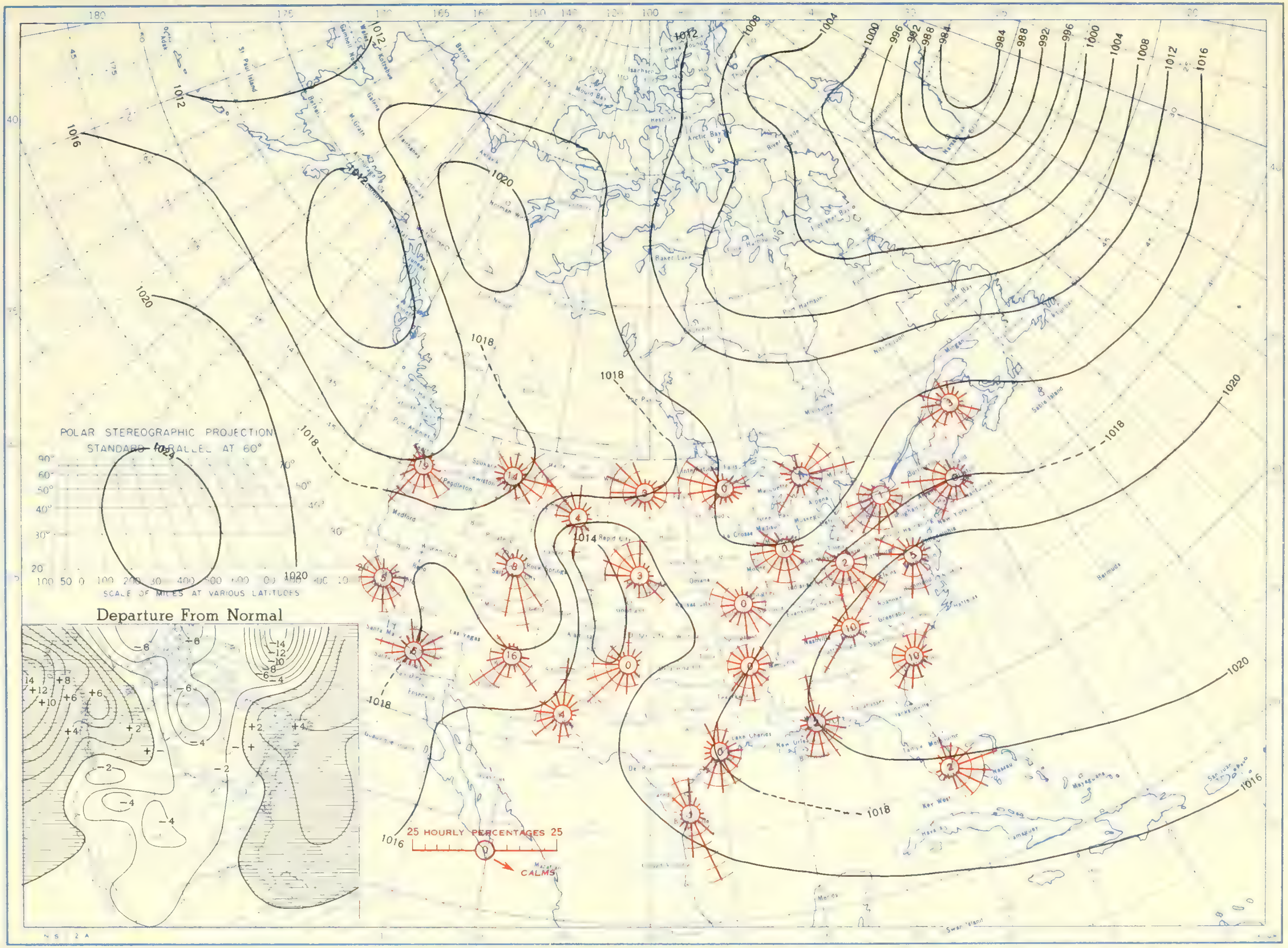
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, December 1951.



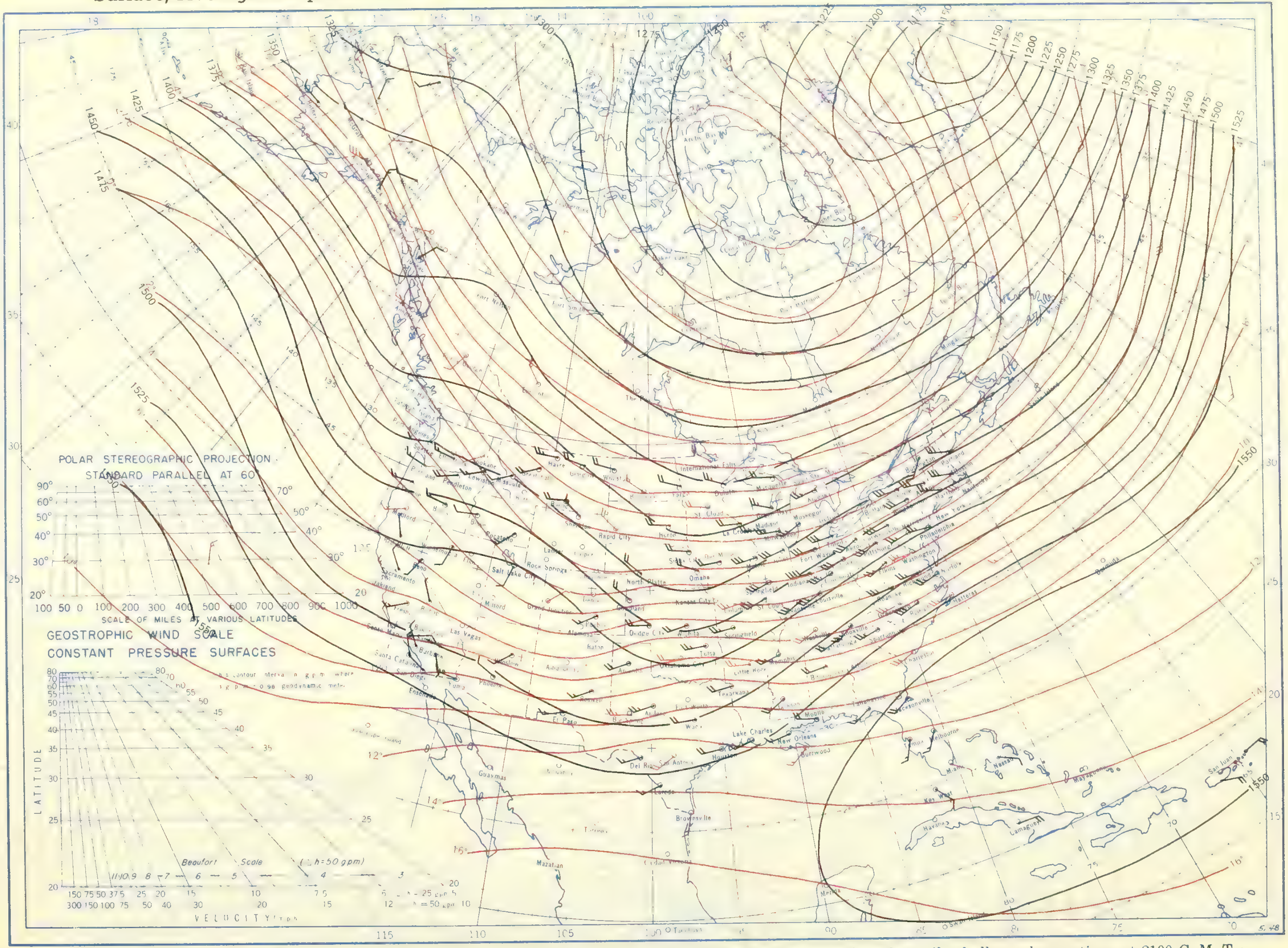
Circle indicates position of center at 7:30 a. m. E. S. T. See Chart IX for explanation of symbols.

Average Pressure (mb.) from Normal, December 1951.



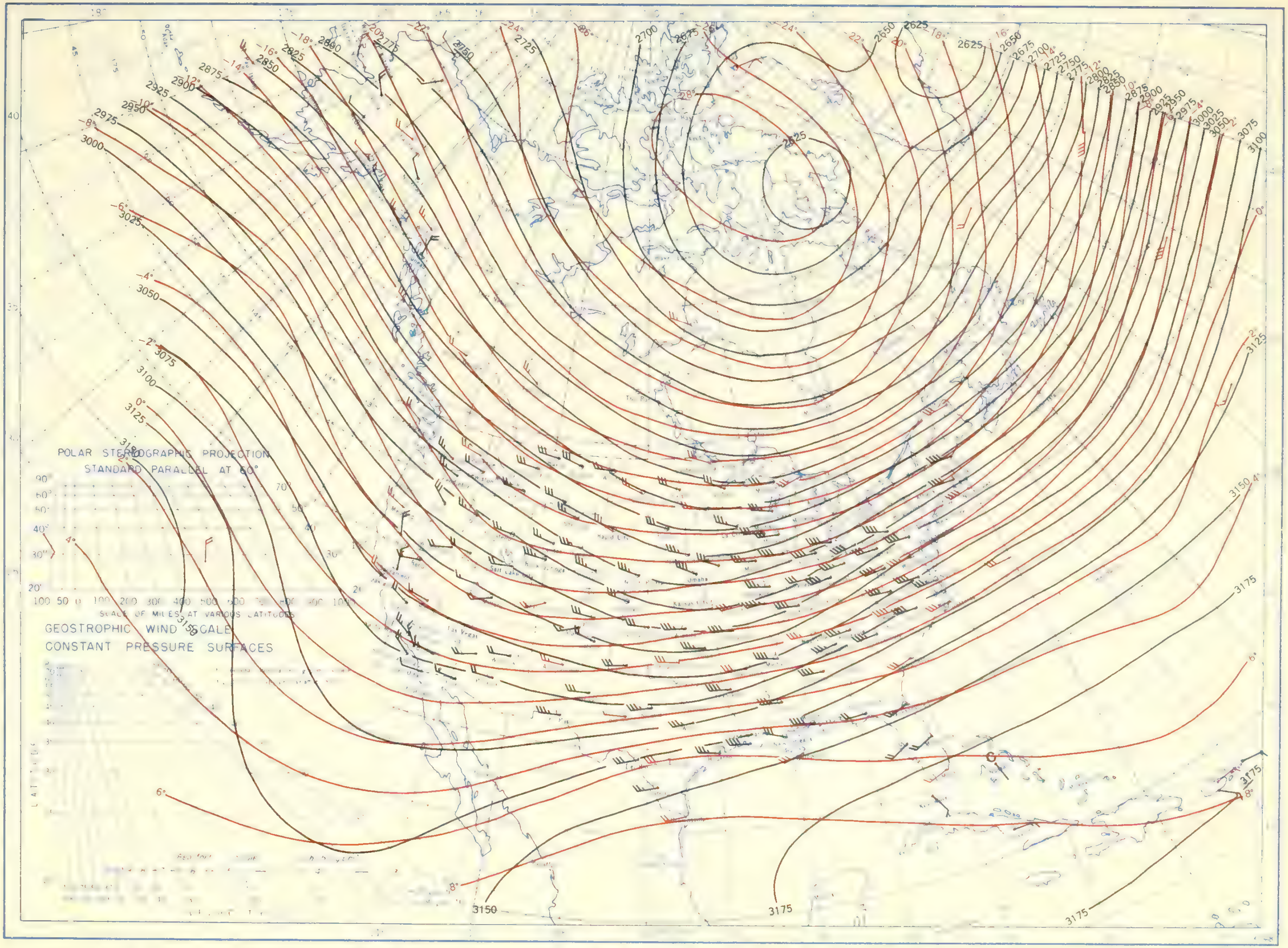
Average sea level pressures are obtained from the averages of the 7:30 a. m. and 7:30 p. m. E. S. T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), December 1951.



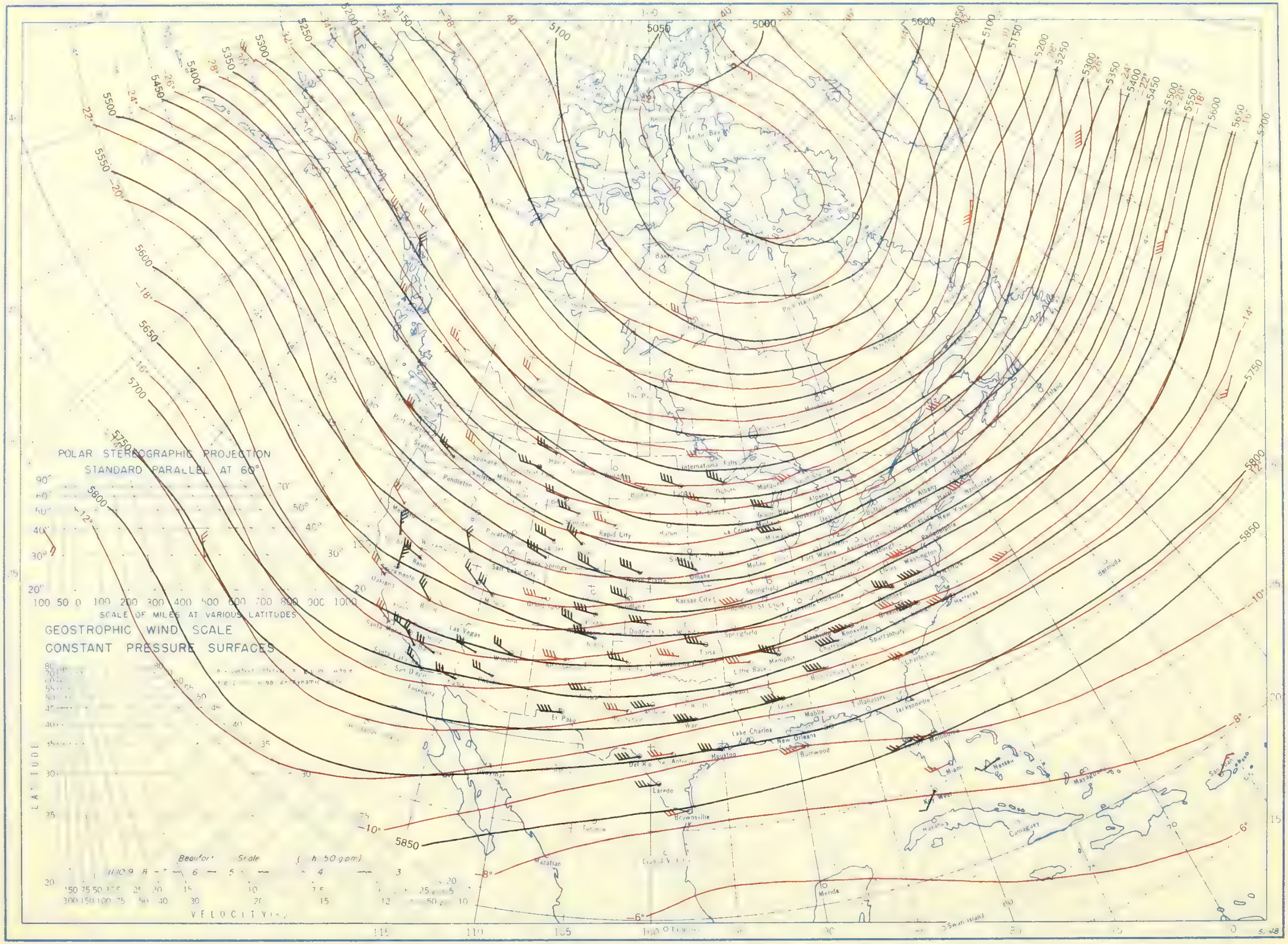
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), December 1951.



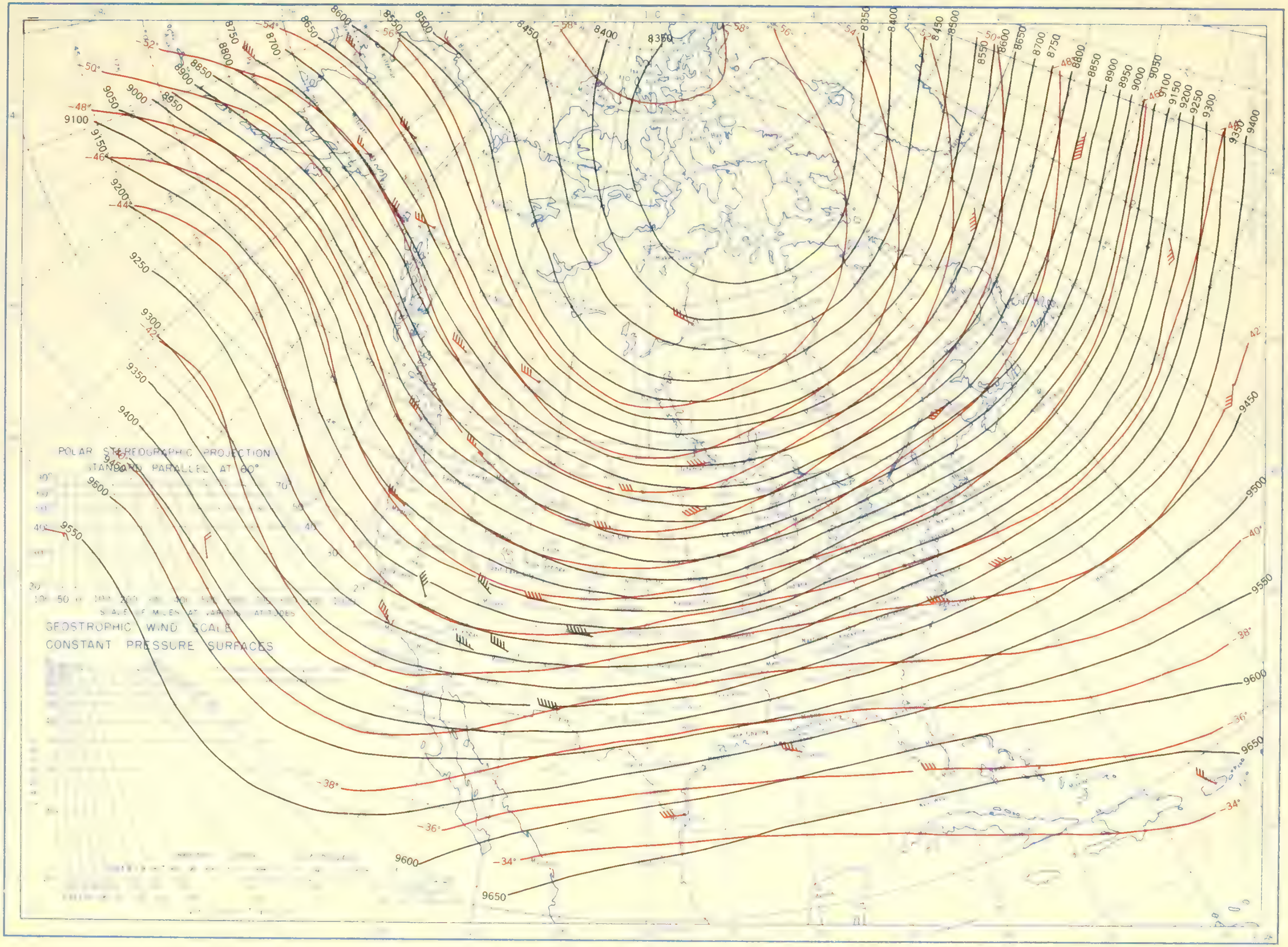
Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T.

Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), December 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.: those shown in red are based on rawins at 0300 G. M. T.

Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), December 1951.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T.

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CLIMATOLOGICAL DATA

NATIONAL SUMMARY

ANNUAL 1951
Volume 2 No. 13

ASHEVILLE: 1952

CONTENTS

SURFACE DATA

Page

General Summary of Weather Conditions 1
Average Monthly and Annual Temperatures by States 6
Departures from Normal of Monthly and Annual Temperatures by States 6
Departures from Normal of Annual Temperatures for Past Years by States 7
Average Precipitation by States 7
Percentage of Normal Monthly and Annual Precipitation by States 8
Percentage of Normal Annual Precipitation for Past Years by States 8
Total Evaporation and Wind Movement by Stations 9
Excessive Precipitation (Short Duration Rainfall) by Stations 20
Sunshine, Amount, and Percent by Stations 29
Annual Climatological Data by Stations 32

STORM DATA

General Summary of Tornadoes in the United States 42
Tornado Data 44
Tornado Summary 54
Number of Tornadoes, Tornado Days, and Resulting Losses for Past Years 57
Hailstorm Losses 58
Hailstorm Losses for Past Years 59
Windstorm Losses 59
Windstorm Losses for Past Years 60
General Summary of North Atlantic Hurricanes and Tropical Disturbances 61
North Atlantic Hurricanes and Tropical Disturbances 64
North Atlantic Hurricanes and Tropical Disturbances for Past Years 65

FLOOD DATA

General Summary of Flood Losses for 1950 66
Estimated Flood Losses for 1950 67
General Summary of Flood Losses for 1951 72
Estimated Flood Losses for 1951 73
General Summary of River and Flood Conditions for 1951 78

UPPER AIR DATA

Radiosonde Data 79
Pilot Balloon Data 82
Rawin Data 83

SOLAR RADIATION DATA

Average Daily Values and Percentages of Normal by Stations 84
Daily Totals and Average Daily Totals by Weeks of Direct and Diffuse Radiation at Stations not Available for Publication in Monthly Issues 85

CHARTS

I----Departure from Normal of Annual Average Temperature (°F) at Surface, 1951
II---Percentage of Normal Annual Precipitation, 1951
III--Tracks of Tornadoes, 1951
IV---Tracks of North Atlantic Hurricanes and Tropical Disturbances, 1951

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U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOLOGICAL DATA

NATIONAL SUMMARY

Volume 2 No. 13

YEAR 1951

GENERAL SUMMARY OF WEATHER CONDITIONS

In general, 1951 was a cold, wet year, with more than the usual number of weather extremes. The temperature averaged 52.4° which was 0.8° below the long-term mean and 0.1° below the average for 1950. The year was warmer than normal in the extreme eastern and southern tier of states from Maine to Arizona and in the southwestern portion of the far Western Plateau, but plus departures exceeded 2° in only scattered areas. Elsewhere the year was colder than normal, with deficiencies of 5° or more in the north-central interior. Average monthly temperatures were below normal in all except 3 months, with November showing the greatest deficiency, 3.6°. The greatest excess, 1.4°, occurred in February. Extreme temperatures ranged from -60° at Taylor Park, Colo., on February 1 to 125° at Cow Creek, Calif. on July 18. This extreme minimum was the lowest temperature ever recorded in Colorado, and the tenth time that a minimum as low as -60° has been recorded officially in the United States. During this coldest period of the year all-time lows were recorded in New Mexico with -50°, and in Indiana with -35°.

Total precipitation for the United States averaged 30.22 inches, which was exactly an inch above the long-term mean and 0.54 inch above the 1950 total. The departure pattern was very uneven, especially in the far West. In the extreme eastern and southern portions of the country from Virginia to Arizona precipitation was generally deficient. There were marked excesses in the central and north-central interior, in the extreme northeast, and in central Arizona and northern Utah. Extreme deficiencies occurred in southwestern Texas and southeastern New Mexico. For the entire United States, January, April, May, and August were the only months showing deficiencies, and May showed the greatest, 0.50 inch. December had the greatest excess, 0.66 inch. This was the wettest year on record in Kansas and Michigan. Annual rainfall ranged from 140.16 inches at Valsetz, Oreg. to 0.32 inch at Greenland Ranch, Calif.

In most areas snowfall was above normal for the year. The average annual snowfall for Iowa, Wisconsin, and Michigan was the greatest on record. Snowfall was not unusually heavy in January and February, although it occurred at stations near the mouth of the Mississippi River for the first time in many years. But March snowfall was extremely heavy in northern areas westward from the Great Lakes. During the first 3 days of June one of the heaviest late-season snowstorms on record occurred in the northern Rockies, with amounts for the storm ranging up to 30 inches in Wyoming. Snowfall began in September in many northern areas and was heavier than usual during the remainder of the year, with two outstanding storms. The first occurred in southern Missouri and surrounding areas from November 5 to 7 and the second during the closing days of December when heavy snowfall from the Sierra Nevada Mountains in central California to the Continental Divide set new all-time records in northern Utah and western Colorado.

The outstanding feature of the year's weather was the persistent cold, wet weather in the central and north-central interior, which resulted in one of the most destructive floods in the Nation's history, and in reduced yields and poor-quality corn and wheat in many areas.

Severe local storms were frequent during June and July in central areas and caused more than the usual amount of damage. During the closing days of January one of the worst ice storms on record occurred over a large area from eastern Texas to New England and was followed by a damaging freeze in the western Gulf States. The hurricane season was mild: there was no loss of life, and in few seasons has damage been less.

SYNOPSIS BY MONTHS

JANUARY.--Temperature and precipitation averaged near normal and there were few unusual extremes. The precipitation pattern was very uneven. Chief cold periods were from the 4th to the 9th and during the closing days. The latter was Nation-wide and was especially severe in the north-central interior where blizzard conditions, road-blocking snows, and subzero temperatures occurred.

During the first week pronounced low pressure, damaging winds, and heavy rains occurred in the Pacific Northwest, frequent light precipitation fell in the north-central interior, and heavy rains fell in the Ohio and Mississippi Valleys. Precipitation during the second week was light to moderate in California and the Northwest, with thundersqualls and tornadoes in the central coastal districts of California; and light to heavy precipitation fell in the eastern half of the country. The third week was very dry except for moderate to heavy precipitation in the mountain ranges in the Pacific States and in northern Utah and Nevada. Light to moderate precipitation was rather general east of the Mississippi River on the 23d and 24th, and on the 25th high winds and heavy precipitation occurred again over Washington.

Snowfall was generally above normal in the western mountains and in a belt extending from central Texas to the Lakes Region. At the end of the month the snow-cover was unusually deep in northern areas, and a few inches of snow covered the ground in a narrow belt extending from northeastern Texas to western Tennessee. The most damaging weather element of the month was an ice-storm during the closing days that continued into February. This storm extended from Texas to New England, with heaviest damage in Louisiana, Mississippi, and Tennessee.

FEBRUARY.--Precipitation averaged about normal and temperature above normal. Temperatures were slightly above in practically all areas, except in the Northeast and northern Great Plains where plus departures were as much as 6°. Precipitation was generally below normal in the Southwest and Northeast, and generally above in central and extreme northern areas. Precipitation was generally well spaced through the month and there were no unusual extremes. Snowfall was above normal in the extreme north-central interior and in scattered central areas. During the early days of the month snow fell at the mouth of the Mississippi River and at some stations in Florida for the first time in many years, and moderate to heavy amounts fell in middle and northern latitudes east of the Mississippi. At Hatteras, N. C., 5.9 inches of snow which fell on the 3d exceeded the previous record monthly total for February. At the same time, up to 15 inches of snow fell in southern New England and near-blizzard conditions prevailed in eastern New York. Moderate to heavy snow fell in the lower Great Plains from the 12th to the 16th, and heavy snows in north-central areas on the 28th closed many roads. Snowcover was unusually extensive east of the Rockies when the month opened, but after the first week had receded to northern areas except in the lower Ohio Valley where it did not disappear until the 13th. The first 3 days of the month was also a period of extremely low temperatures. Subzero minima occurred in all except 4 states and freezing occurred in most of the South. Colorado, New Mexico, and Indiana recorded all-time low temperatures of -60°, -50°, and -35° respectively. Periods of continuous sub-freezing were the longest on record at many stations in southern Texas. On the 3d, low temperatures in Florida ranged from 10° in the north to near freezing in the extreme south. The ice-storm that began during the closing days of January and continued in some areas into the first day of February was one of the most destructive on record. In Mississippi and Louisiana forest destruction amounted to $40,000,000, and damage from the freeze which followed brought the total damage in these two States to more than $68,000,000. Damage in nearby states totaled several millions more. East of the Rockies the weather was extremely cold again on the 7th and 8th, and on the 15th and 16th. After the 18th temperatures were unseasonably mild; thawing kept fields and secondary roads muddy in northern areas; and there was frequent fog in the northeastern quarter. Thunderstorms were unusually frequent and widespread during the last decade. A severe storm of wind and rain occurred in the Northeast on the 7th and 8th. Heavy rains and melting snow caused severe flooding in eastern Kentucky on the 1st. In parts of the Southwest small grains continued to suffer from lack of moisture.

MARCH.--The temperature averaged below normal. Averages were above normal in extreme southern areas, along the Atlantic coast, and in the northeastern interior, with departures of as much as +5° in the Northeast. Elsewhere averages were below normal with greatest minus departures in the north-central interior where they ranged up to 12°. This was the coldest March on record in Montana, the coldest in Washington since 1890, and the coldest in the Dakotas since 1899. Monthly minima approached record-low levels in many western areas. Low temperatures of -44° and -24° in Montana and Arizona respectively were within 1° of the State records for March. A damaging freeze occurred in southern Arizona on the 3d and 4th and in the Central Valley of California on the 31st. A damaging freeze in the Gulf area on the 13th and 14th caused over $2,000,000 damage in Louisiana and Mississippi.

Precipitation averaged slightly above normal, with most of the excess occurring east of the Rocky Mountains. In the Gulf areas monthly totals ranging up to more than 19 inches caused some flooding. Flood damage in Alabama was estimated at more than $2,000,000. Floods caused by heavy rains in the Catskill Region of New York during the closing days of the month caused $2,000,000 damage. Precipitation was generally below normal west of the Great Plains except in the extreme Northwest. Much below normal amounts in the Southwest aggravated the drought conditions and dimmed the outlook for irrigation water.

Snowfall was generally above normal in northern regions except in the Northeast. Snowfall was much above normal in the Northwest, the heaviest of record for March in Washington and Oregon and the heaviest in Idaho since 1917. Record snowfall also was measured in north-central areas, monthly averages for Minnesota, Iowa, and Wisconsin being the highest on record for March. An unusually heavy snowstorm occurred in southern Michigan on the 23rd and 24th, 33 inches falling at Detour. The frequent, heavy snows in north-central areas often were accompanied by strong winds, and heavy drifting closed many roads. On the 13th some snow fell as far south as Mobile, Ala., and Crestview, Fla. Although snowfall was below normal in the Northeast, frequent light snows were adequate for winter sports. Deep snow covered extreme north-central areas during the entire month, and some stations recorded record depths for the end of March.

Losses and deaths from severe storms were less than usual. In the upper Mississippi Valley snowmelt caused flooding in several streams during the last week. In the north-central interior, agricultural activities were 1 to 3 weeks late due to cold, wet weather. Continued drought conditions in the Southwest were unfavorable for winter grains.

APRIL.--The month was colder than usual and slightly deficient in precipitation. The first two decades were unusually cold and wet in the central and southeastern portions of the country, warm and wet in the Northeast, and warm and dry in the far West. The last decade was cool and showery in the far West, but elsewhere temperatures were above normal, with heavy rains in central areas. Average temperatures for the month generally were above normal west of the Continental Divide and in the Northeast, but below elsewhere. Plus departures were as much as 5° in the Northeast, north-central California, and south-central Oregon, and minus departures as much as 5° in central areas. Freezes occurred as far south as the northern portions of the Southern States on April 2 to 4, 11 to 13, and 16 to 18. An unusually cold period occurred in the Northwest from about the 18th to the 22d, with a number of stations recording their lowest April minima on record. The precipitation pattern was irregular, with above-normal amounts in the parts of the Southwest, east of the Mississippi River, and in Iowa and eastern Kansas and Nebraska. Deficiencies generally were greatest in the Great Plains and extreme Northwest. In general, above-normal monthly snowfall was confined to the northern Rocky Mountains and a few north-central areas. In north-central areas snowfall was rather general about the middle of the month, ranging from flurries in Oklahoma and the Ohio Valley to moderate to heavy amounts in some extreme northern sections. At the end of the month snow on the ground generally was confined to mountain regions with a few patches along the North-Central Border. Agricultural activities were delayed and growth of vegetation slowed by cold, wet weather, while winter grains continued to suffer from lack of moisture in many sections of the lower Great Plains. The heavy freeze in the Northwest from the 18th to the 22d caused some crop damage. Severe storms were relatively few, and resulting damage less than usual. Damaging floods occurred along the upper reaches of the Mississippi River and along the Red River of the North.

MAY.—May was generally a little warmer and drier than usual. Average monthly temperatures showed only slight departures from normal, but the range of fluctuations was considerable. In the far West freezes at the beginning, about the middle, and again at the close of the month caused some crop damage in the Northwest. In the extreme Northwest during the freeze at the beginning of the month some stations recorded record low May minima and also the latest freeze on record. During the latter part of the month several stations in the central Gulf area and in the Southwest established record May maxima. Only spotted areas showed above-normal precipitation and these were mostly in Arizona and the Great Plains. The month's heaviest precipitation occurred in the central and lower Great Plains, with monthly totals ranging up to more than 14 inches, and official 24-hour amounts up to more than 9 inches, with unofficial amounts up to 19 inches. These heavy rains resulted in many flash floods that caused considerable damage and several deaths. Precipitation was very deficient in the South and Southeast where crops needed rain badly at the end of the month. A heavy snowstorm occurred in western Montana during the last week. Most of the month's severe storms occurred in the Great Plains, the most damaging one being a hail-and-wind storm which swept western Kansas on the 29th and 30th, causing crop, property, and livestock losses exceeding $6,000,000. A severe tornado passed through Archer County, Tex., on the 18th, leaving 2 persons dead, 100 injured, and $1,500,000 damage. Severe hailstorms occurred at Roswell, N. Mex., on the 20th and at Abilene, Tex., on the 24th. A sandstorm caused $590,000 crop losses in southeastern Missouri on the 27th. The earliest hurricane on record passed northward off the Atlantic Coast from the 17th to the 21st. Except for the freezes in the extreme Northwest and droughty conditions in parts of the South, weather conditions were generally favorable for agriculture.

JUNE.—June was much colder than normal in the north-central interior, but warmer than normal in the Pacific States and in the South and East. Many stations in the Great Plains and Rocky Mountain States recorded record June minima, and a new all-time June low for Nebraska, 23°, was recorded at Harrison on the 3d. Also this was the coldest June on record in Montana; but near-record June maximum temperatures were recorded at some stations in the Gulf and Atlantic Coastal States. Precipitation was generally deficient in the far West but was much above normal in most areas eastward from the Great Plains except in some Atlantic coastal areas. This was the driest June on record in eastern Washington and Oregon and one of the driest in Arizona and New Mexico. A high fire hazard prevailed in many sections of the far West. In the central Great Plains, monthly totals ranged up to 18.72 inches and set new records at many stations, and rainfall was of near record frequency. Scattered stations in the Northeast also recorded record June totals. Heavy rains in parts of Kansas, Oklahoma, Missouri, and Illinois caused severe flooding and many streams were still rising at the end of the month. An unusually heavy late-season snowstorm occurred in the northern Rockies and in the western portions of the northern Great Plains during the first 3 days of the month. Thirty inches of snow fell at Middle Fork, Wyo. on June 1. A great number of severe local storms caused over $70,000,000 damage, much of it in the central Great Plains. Except for floods and too much rain in some central areas, weather conditions were generally favorable for agriculture.

JULY.—Temperature and precipitation averaged about normal for the country as a whole. Temperature departures were below normal in north-central areas and generally above elsewhere. It was the hottest July on record in New Mexico. The precipitation departure pattern showed great variations. Totals amounted to twice the normal quantities along the western slopes of the Rockies, in the central Great Plains, and in the Great Lakes region, but less than one-half normal in the Pacific States and extreme south-central areas. In the Pacific States 516 stations recorded no rain, and the forest fire hazard was high with about 250 fires occurring in Oregon. Heavy rains fell in parts of Nebraska, Missouri, Kansas, and Oklahoma, with monthly totals ranging up to 20.40 inches. These rains, occurring during the first half of the month, sent the Kansas and Missouri Rivers, which were already overflowing from heavy rains in May and June, to record heights, and the result was one of the most destructive floods in the history of the country. There was some snowfall at high stations in the northern Rockies, 6.5 inches falling at the east entrance to the Yellowstone National Park on the 10th. Severe storms, which were numerous in central areas, caused over $25,000,000 damage. Minnesota reported its most damaging tornado of record on the 20th. Weather conditions were mostly favorable for the major agricultural crops, although rain was needed for dry land crops in the far West and southern Texas, and too much rain in many central areas delayed cultivation of corn. The drought in southern Texas reduced the cotton yield.

AUGUST.—The weather was abnormally cool in the northern interior, but much warmer than normal in southern areas east of the Rocky Mountains. This was one of the hottest Augusts on record for the Gulf States. State average temperatures for Louisiana and Alabama established new records and that for Florida equaled the previous record. Extreme high temperatures set few records, but high temperatures exceeding 90° or 100° were persistent. For example, the maximum temperature at Fort Worth, Texas reached 100° or higher on 24 days. In northern sections east of the Rockies cloudy weather held maxima to below-normal levels, and there were periods of unusually low temperature at the beginning and close of the month, with frost at a few places in Wisconsin and Pennsylvania during the first week. Precipitation averaged about normal for the country, but was above normal in the Rocky Mountains and the north-central interior and deficient west of the 115th meridian, in the lower Great Plains, and east of the Mississippi River except in the Lake Region. It was the second wettest August on record in Montana, and in Arizona it was the wettest month since 1921 and the wettest August since 1909. Monthly totals and 24-hour amounts set new records at a number of stations in northern Utah, central Arizona, and southern California. San Diego, Calif., recorded its greatest August total since 1850. In some sections of the South heat and drought lowered crop yields and reduced stream flow to record low levels. This was the driest August on record in Louisiana and the second driest in Mississippi. Droughty conditions prevailed in southern Ohio and northern West Virginia. Much cloudiness prevailed in north-central areas, with Minneapolis, Minn., reporting the least sunshine since sunshine records began in 1914. Severe storms were less frequent than during June and July, but still more frequent than usual. The most destructive storm of the month was a combination of wind and hail that destroyed 10,000 to 12,000 acres of cotton in the vicinity of Dean, Tex., on the 10th. Several damaging flash floods occurred in the extreme Southwest during the last week. Hot, dry weather caused premature opening of cotton bolls in several sections, and cool, wet, cloudy weather slowed corn development and delayed grain harvest in the north-central interior. At the close of the month dry land crops in the far West generally were in need of more moisture.

SEPTEMBER.—This month was cooler and slightly wetter than normal. Cool, wet, cloudy weather, continuing in north-central areas was unfavorable for development of major crops, but the month brought relief from the drought in the Northwest and from the drought and heat in the Southern States. In most areas there were no unusual extremes of temperature or precipitation. Killing frosts, however, were somewhat earlier than usual in northern areas. Snowfall was unseasonably early in the north-central interior. Severe storms were fewer than usual. No major floods occurred and stream flow in the South remained very low. In the north-central interior temperatures averaged as much as 5° below normal. It was the coldest September in Minnesota since 1918 and in North Dakota since 1934. Precipitation was much below normal in the Southwest, but much above in the Southern States where the drought was broken by general rains from the 13th to the 17th. Storm damage was over $4,000,000, more than half of which resulted from hail in the northern Great Plains. The most destructive storm of the month occurred in the Colorado Springs area of Colorado, where hail caused $1,500,000 damage on the 4th. The biggest hailstone ever reported in Minnesota fell at Sartell on the 5th. This stone measured about 9.5 inches in circumference and weighed about 2 pounds. In the more northern sections of the Corn Belt, killing frost occurred before a part of the crop matured, causing considerable loss. Pastures in this area, however, were the best in years. Grains still needed more rain in the Northwest, but in the Great Plains, moisture was ample for seeding the winter wheat crop. The weather was ideal for harvesting crops in the far West.

OCTOBER.--For the country as a whole temperature and precipitation averaged about normal. Below-normal temperatures from the central and northern Great Plains westward to the coastal ranges in the Pacific States were offset by above-normal temperatures elsewhere. There were periods of unseasonably low temperatures in the northwestern quarter of the country during the latter half of the month. The departure pattern of precipitation was very uneven. There were marked deficiencies in the Gulf coastal areas and a few extreme north-central areas, and marked excesses in parts of the Northwest, the southern Rockies, and in much of the area from the Lakes Region to the northern portions of the Southern States. This was one of the wettest Octobers on record in Oregon and Idaho, and monthly totals were as much as 200 to 300 percent of normal in eastern Oklahoma and western Arkansas. In a strip across southern Florida, including Fort Myers, monthly totals ranged up to more than 17 inches and a few stations recorded 24-hour totals exceeding 10 inches. Snowfall was above normal in most northern areas. The snowfall in Minnesota was the greatest on record for October. During a snowstorm on the 30th, up to a foot of snow blocked roads in parts of Minnesota, Wisconsin, and Michigan, and light snow fell as far south as northern Texas. Severe storms were relatively few and total damage correspondingly small; also, there was no serious flood damage. Weather conditions were very favorable for harvesting fall crops, except in north-central areas where damp weather hampered soybean harvest and prevented corn from drying enough for safe cribbing. In the Great Plains winter grains got a good start.

NOVEMBER.--Based on Nation-wide averages, this was the second coldest November since 1893 and precipitation was somewhat above normal. In many northern areas winter-like weather began at the start of the month. In extreme north-central areas streams and lakes froze over during the first week. California was the only State warmer than normal. Monthly averages for nine central States were the lowest on record. In north-central areas temperatures during the first week averaged 20° or more below normal, and subzero minima were recorded as far south as Kansas. Precipitation generally was above normal in the East and far West and below in the Great Plains. In West Virginia, Virginia, and the Carolinas, precipitation was ample to relieve the prolonged dry conditions that had prevailed in parts of those States. A marked deficiency in the lower Great Plains prolonged the long period of deficient precipitation in some areas. Snowfall was much above normal in the central Great Plains and Northeast. Average snowfall for Michigan, Illinois, Missouri, and Oklahoma was the greatest of record. The principal snowstorm of the month occurred from the 5th to the 7th, leaving as much as 10 inches or more of snow on the ground in parts of eastern Kansas, eastern Oklahoma, southern and central Missouri, central Illinois, northern Indiana, and lower Michigan. Many new snowfall records were set in southern Missouri, where depths ranged up to 20 inches. A depth of 28 inches was measured near Buffalo, N. Y., on the 5th. On the 26th general snowfall in New England ranged from 2 to 17 inches. At the end of the month most of the snow left on the ground was confined to mountainous areas in the Northeast and far West. Damage from high winds occurred in New England on the 1st and 3d, and in Washington and Oregon on the 10th and 11th. There was an outbreak of tornadoes in south-central areas from the 13th through the 15th, and a damaging snowstorm occurred in Minnesota on the 13th and 14th. In the north-central interior, cold, damp weather again hampered corn picking and kept corn too moist for safe cribbing. Small grains in parts of the lower Great Plains needed more moisture. An early frost caused extensive light to moderate crop damage in the South.

DECEMBER.--Temperatures averaged much below normal except that they were above in the East and South. Monthly temperature ranges were high, and extreme temperatures set several new records. The second decade and the first part of the third combined in a period of severe cold, but the first week and last 3 days were periods of abnormal warmth. Precipitation averaged above normal, although there were marked deficiencies in the lower Great Plains and extreme southern Florida. Snowfall was unusually heavy in northern and western areas and locally new records were established. Pressure generally averaged below normal, and the passage of several intense storms, especially in the northern half of the country, caused rapid changes. Precipitation exceeded 200 percent of normal in the western portions of Oregon and California, along the western slopes of the Rockies, and in Tennessee and the lower Ohio Valley, but it was well spaced through the month and did not result in any serious flooding. On the 14th light to moderate snowfall caused severe traffic jams in several metropolitan areas along the central Atlantic Coast. On the 17th, 34 inches of snow fell at Watertown, N. Y. Four deep low pressure areas moved into the Northwest, with the one on the 4th bringing low pressure records and widespread damaging winds. Storms of great intensity crossed the Great Plains on the 5th and 6th, and the Northeast on the 14th and 15th, and 18th and 19th. Tornadoes were more numerous than usual, and this was the first December they ever were reported from Oregon and Massachusetts. A severe blizzard occurred in the Kalispell area of Montana on the 18th and 19th. In the South weather conditions were generally satisfactory for agriculture, with the freeze about the middle of the month causing only light, scattered damage. Small grains in the western portions of the lower Great Plains needed moisture. In northern areas a heavy snowcover limited grazing more than usual, necessitating heavy supplemental feeding.

Table 1

AVERAGE TEMPERATURE

YEAR 1951

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	47.9	50.3	57.1	61.8	70.5	78.9	81.3	82.9	76.4	66.8	49.5	50.9	64.5
Arizona	41.9	45.0	49.7	57.3	65.7	72.3	81.7	77.3	73.3	61.7	48.7	40.9	59.6
Arkansas	41.5	44.3	51.3	58.1	69.1	75.9	80.5	81.5	71.9	63.1	45.0	43.9	60.5
California	44.4	47.1	50.9	57.4	63.2	69.8	75.6	73.7	71.8	60.5	51.4	43.2	59.1
Colorado	23.6	29.3	32.9	42.2	53.5	58.2	68.9	66.1	57.6	46.2	32.1	24.2	44.6
Connecticut	30.7	32.1	37.9	49.1	58.6	65.3	71.7	69.1	62.4	53.9	38.4	32.5	50.1
Delaware	37.5	37.3	42.9	52.8	62.7	71.1	76.1	74.0	67.9	59.8	43.5	39.6	55.4
Florida	59.3	59.6	65.8	68.7	75.1	80.4	81.7	83.3	81.1	75.3	63.3	64.6	71.5
Georgia	48.8	50.5	56.7	62.4	69.7	79.0	80.6	81.8	76.4	67.9	51.7	51.9	64.8
Idaho	23.4	30.1	31.5	46.3	53.4	57.1	69.0	65.4	57.8	44.7	33.1	22.6	44.5
Illinois	28.4	31.2	37.8	49.6	64.7	69.7	74.8	73.0	64.0	57.4	35.5	29.7	51.3
Indiana	30.4	30.7	38.8	49.0	63.7	70.0	74.1	72.1	63.9	57.3	35.3	30.8	51.3
Iowa	17.9	24.3	27.5	44.4	62.2	65.2	72.1	70.5	59.8	52.0	31.0	20.3	45.6
Kansas	30.1	36.5	39.4	51.0	64.2	68.8	76.8	77.9	65.4	55.9	38.8	31.3	53.0
Kentucky	37.8	38.3	45.4	53.8	65.6	73.4	76.9	76.0	67.8	59.4	40.4	39.5	56.2
Louisiana	52.2	54.3	60.8	64.2	73.7	80.7	82.6	85.1	78.1	69.7	54.8	56.1	67.7
Maine	21.1	22.7	30.3	43.8	53.6	60.5	67.0	65.0	58.2	47.7	33.3	21.2	43.7
Maryland	35.4	36.7	43.1	53.0	62.7	71.0	76.0	73.6	67.9	59.2	42.1	38.3	54.9
Massachusetts	30.8	31.4	36.9	48.1	57.4	64.2	71.1	68.2	62.6	53.1	39.1	31.9	49.6
Michigan	20.8	22.6	30.3	42.3	57.4	62.1	67.7	64.3	57.3	50.1	29.2	23.8	44.0
Minnesota	5.3	14.6	18.5	39.2	58.4	61.0	68.2	64.5	54.3	45.2	22.9	11.4	38.6
Mississippi	48.5	50.4	57.8	62.2	72.1	79.3	81.9	83.9	76.6	67.0	50.4	52.3	65.2
Missouri	32.6	35.8	41.0	51.6	65.4	71.0	76.7	76.2	65.7	58.4	38.4	32.9	53.8
Montana	14.6	21.7	20.1	39.7	53.0	54.4	67.1	63.2	51.8	41.4	29.6	13.6	39.2
Nebraska	23.8	31.3	31.5	45.1	59.8	63.2	72.3	72.4	59.8	50.5	34.7	22.1	47.2
Nevada	31.9	36.5	39.4	50.4	56.9	64.6	73.7	69.9	64.8	50.0	39.1	28.6	50.5
New Hampshire	23.1	25.7	32.0	44.6	54.7	61.6	68.0	64.7	58.7	49.1	32.9	24.1	44.9
New Jersey	34.6	34.8	41.1	51.3	61.6	68.7	74.3	72.3	65.6	57.3	40.3	36.5	53.2
New Mexico	34.3	38.4	43.5	51.5	61.7	69.2	76.4	73.1	67.1	56.0	41.4	35.5	54.0
New York	25.9	25.9	34.1	45.4	56.7	64.1	69.1	66.3	59.9	51.7	33.2	27.7	46.7
North Carolina	42.8	44.4	50.0	57.9	65.8	74.8	77.5	77.2	71.0	63.2	46.6	44.7	59.7
North Dakota	3.3	11.4	12.5	38.5	56.6	58.6	68.2	63.8	52.7	42.1	21.8	6.1	36.3
Ohio	31.3	31.2	39.7	48.7	61.9	69.7	73.2	71.0	63.9	56.7	36.4	31.7	51.3
Oklahoma	39.1	43.4	49.3	58.2	68.4	75.3	82.3	84.5	72.9	63.0	44.4	41.4	60.2
Oregon	31.8	36.5	37.4	49.0	54.0	60.7	67.4	65.0	60.5	48.4	39.4	30.8	48.4
Pennsylvania	30.9	31.2	38.1	48.4	59.8	67.6	71.7	69.5	63.0	54.8	36.1	31.9	50.3
Rhode Island	33.6	34.8	38.7	49.7	58.1	64.3	72.0	70.0	65.0	54.6	41.8	35.3	51.5
South Carolina	45.9	47.7	54.6	61.1	69.2	77.8	80.2	80.4	74.1	66.5	50.0	49.2	63.1
South Dakota	15.6	25.1	21.0	41.7	57.2	59.7	70.4	68.4	55.7	46.4	29.6	13.1	42.0
Tennessee	40.7	42.6	49.7	55.7	66.3	74.7	78.2	78.6	70.7	61.4	43.2	43.5	58.8
Texas	46.9	50.3	57.4	64.3	72.9	80.0	84.6	85.2	77.6	69.3	53.2	51.0	66.1
Utah	26.2	32.4	36.6	48.6	56.2	62.3	73.0	69.0	62.0	48.8	34.1	23.9	47.8
Vermont	21.0	23.2	31.0	43.5	54.3	62.1	67.6	64.4	58.1	48.8	30.9	22.6	44.0
Virginia	38.8	39.2	45.0	54.5	63.1	71.9	75.8	74.3	68.4	60.1	42.6	39.9	56.1
Washington	31.0	34.6	36.4	48.8	54.8	61.2	67.1	65.1	60.0	48.3	38.6	28.5	47.9
West Virginia	35.3	36.0	42.7	51.0	61.9	69.8	73.1	71.0	64.8	56.9	38.1	36.2	53.1
Wisconsin	11.9	17.9	25.0	41.8	59.5	61.8	68.5	64.6	56.2	48.1	25.6	18.3	41.6
Wyoming	17.8	27.0	26.6	38.6	51.2	53.3	65.8	63.3	52.9	42.6	29.0	18.6	40.6
Alaska	-8.3	.1	2.1	27.3	40.9	49.6	55.0	52.6	43.5	26.1	18.3	2.4	15.8
Hawaii	69.6	68.8	69.8	70.1	72.5	73.5	74.9	74.8	74.9	74.4	71.9	69.8	72.1
Puerto Rico	71.8	70.9	71.6	75.7	77.8	78.5	78.8	79.3	78.6	77.8	76.6	74.7	76.0

Table 2

DEPARTURES FROM NORMAL TEMPERATURE

YEAR 1951

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	+1.0	+1.3	+1.1	-1.6	-0.9	+0.7	+1.0	+3.2	+0.9	+1.9	-4.7	+3.2	+0.6
Arizona	+1.4	+1.3	-.7	-.6	-.1	-2.1	+1.5	-1.0	+.6	-.1	-1.1	-2.0	-.2
Arkansas	+.3	+.6	-1.1	-3.5	.0	-1.2	.0	+1.5	-2.2	+.2	-6.2	+1.1	-.9
California	+.2	-.2	-.3	+.6	+.1	-.1	-.3	-1.1	+2.3	-.7	-.6	-2.4	-.2
Colorado	+.3	+2.0	-1.5	-1.7	+.9	-3.3	+1.5	+.2	-1.8	-1.3	-2.8	-1.8	-.8
Connecticut	+3.7	+5.4	+2.1	+2.8	+1.1	-.8	+1.7	.0	-.2	+1.8	-2.5	+2.5	+1.4
Delaware	+2.5	+2.7	-.7	+.2	-.5	-.4	.0	-.4	-.6	+2.2	-3.2	+2.9	+.4
Florida	+.1	-1.0	+.6	-1.2	-.5	+.5	+.4	+1.9	+.7	+2.3	-1.7	+4.6	+.6
Georgia	+.6	+.8	-.2	-1.6	-2.4	+.4	+.3	+2.0	+.6	+2.5	-3.5	+3.5	+.3
Idaho	-.1	+2.1	-4.2	+1.1	+.2	-3.2	+.6	-1.2	+.5	-2.7	-2.2	-3.7	-1.1
Illinois	+.7	+1.3	-3.2	-2.9	+2.0	-2.4	-1.6	-1.6	-3.7	+1.5	-6.7	-1.5	-1.5
Indiana	+1.7	+.1	-1.7	-2.2	+1.7	-1.2	-1.5	-1.6	-3.4	+2.1	-6.9	-.9	-1.2
Iowa	-1.8	+1.7	-8.2	-4.5	+1.8	-4.3	-2.8	-2.1	-4.6	-.5	-6.4	-4.1	-3.0
Kansas	-.2	+2.5	-4.7	-3.5	+.4	-5.0	-2.8	-.4	-4.6	-1.8	-5.0	-1.6	-2.2
Kentucky	+1.8	+1.0	-1.0	-2.4	+.2	-.5	-.1	+.2	-2.4	+.9	-5.9	+1.7	-.5
Louisiana	+1.1	+.4	+.9	-2.7	+.3	+.7	+.5	+3.3	+.2	+1.6	-3.5	+4.2	+.6
Maine	+4.0	+4.6	+1.3	+2.9	+1.1	-1.1	-.1	-.1	+.4	-.2	-1.8	-.8	+.8
Maryland	+3.2	+3.2	+.3	+.7	-.1	+.2	+.8	+.2	+.4	+2.8	-3.1	+3.1	+1.0
Massachusetts	+4.3	+5.1	+1.7	+2.7	+.9	-1.0	+.6	-.4	+.5	+1.3	-1.9	+1.9	+1.3
Michigan	+.7	+2.5	+.7	-.2	+3.5	-1.8	-1.3	-2.8	-2.7	+1.3	-6.8	-.9	-.7
Minnesota	-3.5	+2.3	-7.4	-3.1	+3.5	-3.4	-1.6	-2.7	-4.2	-.8	-6.5	-3.9	-2.6
Mississippi	+1.2	+.8	+.9	-2.4	+.2	+.4	+.8	+3.1	+.8	+1.4	-4.6	+4.0	+.5
Missouri	+1.8	+2.1	-3.5	-3.8	+.8	-2.3	-1.0	-.3	-3.6	+.7	-6.2	-1.0	-1.4
Montana	-4.2	+.4	-10.3	-3.6	+.7	-5.7	-.6	-2.4	-3.8	-3.9	-2.2	-9.2	-3.7
Nebraska	+.7	+4.9	-5.0	-4.2	+.5	-6.1	-3.2	-1.2	-4.7	-1.5	-2.6	-5.1	-2.3
Nevada	+1.2	+1.4	-2.1	+1.2	-.1	-.6	+.2	-1.6	+2.0	-1.9	-1.5	-3.8	-.5
New Hampshire	+3.9	+6.1	+3.0	+2.6	+.7	-1.4	.0	-.9	+.3	+1.5	-2.5	+.9	+1.1
New Jersey	+3.1	+4.0	+.6	+1.5	+1.0	-.4	+.4	+.3	-.3	+2.4	-2.8	+2.8	+1.2
New Mexico	+.4	+.2	-.3	-.8	+1.1	-.5	+3.1	+1.4	+1.8	+1.2	-1.5	+.1	+.5
New York	+2.7	+3.3	+1.8	+1.1	+.6	-1.0	-.7	-1.4	-1.3	+1.5	-5.0	+1.0	+.2
North Carolina	+1.0	+1.5	.0	-.2	-1.1	+.5	+.6	+1.3	+.1	+2.9	-3.4	+2.1	+.5
North Dakota	-3.6	+.9	-12.2	-2.8	+2.7	-4.5	-1.4	-3.2	-4.4	-1.9	-5.6	-7.9	-3.7
Ohio	+2.2	+1.1	+.7	-1.1	+1.3	.0	-.4	-.6	-1.7	+2.8	-5.2	+.1	.0
Oklahoma	+1.1	+.7	-1.5	-2.3	+.2	-2.3	.0	+2.6	-1.3	-.1	-5.5	+.8	-.6
Oregon	+.1	+.7	-4.4	+1.1	.0	+.9	+.5	-.6	+1.8	-1.9	-.8	-3.5	-.5
Pennsylvania	+2.4	+2.7	+.4	-.2	+.2	-.5	-.4	-.8	-1.0	+2.0	-5.2	+.7	+.1
Rhode Island	+4.0	+5.8	+2.1	+4.1	+2.2	-.4	+1.6	+.8	-1.7	+1.2	-1.3	+2.3	+2.0
South Carolina	-.3	-.2	-.3	-1.3	-1.7	.0	+.3	+1.5	-.5	+2.3	-3.9	+2.4	-.1
South Dakota	-1.5	+5.8	-10.3	-4.3	+.8	-6.4	-2.7	-2.7	-5.9	-2.5	-3.5	-8.9	-3.5
Tennessee	+1.4	+1.3	+.2	-3.0	-.6	-.1	+.4	+1.8	-.7	+1.5	-5.2	+2.7	.0
Texas	+.2	+.3	+.3	-.6	+.9	+.6	+2.4	+3.0	+1.3	+2.5	-2.5	+3.0	+1.0
Utah	+1.4	+2.3	-1.6	+1.6	+.4	-2.2	+1.1	-.9	+1.1	-.6	-3.0	-3.2	-.3
Vermont	+3.2	+5.1	+2.2	+2.0	+.2	-1.0	-.2	-1.0	.0	+1.7	-3.9	+.4	+.8
Virginia	+2.0	+1.8	-.8	-.1	-.8	.0	+.5	+.3	-.1	+2.5	-4.2	+2.0	+.4
Washington	+.2	.0	-4.2	+.2	-.5	+.4	+.4	-.9	+1.1	-1.8	-1.3	-5.1	-1.0
West Virginia	+2.3	+2.4	+.2	-.9	+.1	.0	.0	-.8	-1.4	+2.0	-5.1	+1.6	+.1
Wisconsin	-2.4	+3.0	-3.5	-1.1	-4.1	-3.0	-1.6	-2.8	-3.7	+.3	-7.4	-1.8	-2.3
Wyoming	-1.2	+4.8	-3.2	-1.7	+1.4	-5.2	-.5	-1.0	-1.9	-1.7	-2.4	-3.5	-1.3
Alaska	-9.6	-3.8	-8.5	+4.0	+2.7	-.1	+1.1	+1.5	+.8	-2.8	+6.3	+.1	-.7
Hawaii	+.3	-.4	+.3	.0	+.6	-.1	+.6	-.4	.0	+.4	.0	.0	+.1
Puerto Rico	-.9	-2.2	-1.8	+.8	+1.0	+.8	+.4	+.7	+.3	+.3	+.7	+.7	+.1

DEPARTURES FROM NORMAL ANNUAL TEMPERATURE

Table 3

(For past years)

Section	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Alabama	+0.9	+1.0	+2.0	+0.7	+1.0	+1.1	+0.5	+1.8	+1.2	-1.5	+0.8	-0.3	+0.5	+1.0	+1.2	+1.4	-0.2	+0.7	+1.2	+0.1	+0.6
Arizona	-.2	-.9	-.4	+2.4	-.5	+.9	-.4	-.3	+.1	+1.1	-1.5	-.6	+.9	-1.4	-.5	+.3	+.3	-.4	-.9	+1.3	-.2
Arkansas	+1.1	+.6	+1.8	+1.4	.0	+.6	-.3	+2.2	+1.3	-2.1	+.5	-.4	+.2	+.3	-.6	+1.2	-.6	-1.0	-.1	-1.2	-.9
California	+.4	-1.1	-1.4	+1.5	-1.2	+.6	-.8	-.7	+.2	+.7	-.4	-.6	+.4	-1.2	-.5	-1.0	-.1	-1.6	-1.3	+.6	-.2
Colorado	+1.0	-.2	+1.6	+4.3	+1.4	+1.7	+.7	+1.4	+1.5	+1.3	+.6	-.2	+1.3	-.3	-.1	+1.1	+.2	-.6	+.2	+.9	-.8
Connecticut	+2.6	+1.6	+1.0	-.2	-.3	+.2	+1.3	+1.5	+.3	-2.3	+.4	+.4	-.7	+.2	+.2	+.8	-.3	-.2	+2.8	+.1	+1.4
Delaware	+2.2	+1.6	+1.3	-.3	-.5	+.1	+.4	+1.3	+1.2	-2.3	+.7	+.4	+.1	+.1	+.2	+1.1	-.4	-.2	+2.2	-.4	+.4
Florida	.0	+1.1	+1.2	+.1	.0	+.1	-.1	+.3	+.7	-1.7	.0	-.3	-.3	+.4	+1.0	+1.5	+.5	+1.8	+1.7	+.7	+.6
Georgia	+1.0	+1.2	+1.7	+.1	+.4	+.5	.0	+1.1	+1.0	-1.7	+.5	-.4	-.1	+.1	+.6	+1.0	-.8	+.6	+1.2	-.1	+.3
Idaho	+.3	-1.5	-.5	+4.3	-.6	+.2	-.8	+.9	+1.4	+2.3	+1.0	-1.0	-.1	-.8	-.3	.0	+.6	-1.2	-.8	-.2	-1.1
Illinois	+3.5	+.7	+2.3	+1.8	-.1	+.5	-.8	+2.7	+1.9	-.8	+2.0	+.3	-.4	+.9	-.7	+2.3	-.2	+.1	+1.2	-1.5	-1.5
Indiana	+2.9	+.7	+2.1	+1.2	-.1	+.3	-.7	+2.3	+1.7	-1.1	+1.7	+.3	-.4	+1.1	-.5	+2.1	-.7	+.2	+1.4	-1.4	-1.2
Iowa	+5.0	.0	+2.6	+3.3	+.4	+.4	-.7	+3.0	+2.9	-.3	+2.9	+.7	-.3	+1.1	-.5	+2.5	+.7	+.4	+.6	-2.6	-3.0
Kansas	+2.4	-.3	+2.8	+3.5	+.9	+1.3	-.4	+2.9	+2.8	-.4	+1.2	.0	+.4	+.1	-.4	+2.8	+.2	-.4	-.4	-1.1	-2.2
Kentucky	+2.3	+1.0	+1.7	+.9	+.1	+.7	-.4	+1.9	+1.2	-1.9	+.9	-.1	-.1	+.7	.0	+1.5	-1.0	+.1	+1.2	-1.0	-.5
Louisiana	+.2	+.5	+2.2	+.8	+.8	.0	-.1	+1.0	+1.0	-1.8	+.2	-.8	-.2	+.4	+.4	+.8	-.6	+.1	+.7	+.6	+.6
Maine	+3.1	+2.2	+.7	-.2	+.2	+.5	+3.0	+2.2	-.2	-.6	+1.2	+1.3	-.7	+1.0	+.7	+1.1	+1.3	+.3	+2.7	+.8	+1.6
Maryland	+1.9	+1.0	+.8	-.2	-.5	+.2	.0	+1.3	+1.3	-1.8	+.9	+.7	+.3	+.4	+.6	+1.7	+.2	+.5	+2.7	+.6	+1.0
Massachusetts	+1.9	+1.1	+.6	-.4	-.4	+.1	+1.3	+1.4	+.1	-1.7	+.8	+.4	-.8	+.3	+.5	+1.2	+.7	+.1	+3.1	+.4	+1.3
Michigan	+3.8	+.9	+1.2	+.2	-.5	-.7	+.1	+1.8	+.9	-1.0	+1.8	+.4	-1.4	+1.0	-.4	+.7	+.2	+.4	+2.1	-1.4	-.7
Minnesota	+5.2	-.4	+.6	+1.4	-.5	-2.0	-1.3	+1.8	+1.9	-.1	+2.5	+.9	-.9	+1.5	-1.0	+.7	-.1	+.2	+.5	-4.0	-2.6
Mississippi	+.7	+.5	+2.1	+.9	+.5	+.3	+.1	+1.6	+.9	-2.3	+.5	-.5	+.3	+.6	+.4	+.9	-.8	-.1	+1.1	+.1	+.5
Missouri	+2.8	+.4	+2.1	+2.2	-.2	+1.1	-.7	+3.2	+2.2	-1.2	+2.0	+.3	-.1	+.7	-.5	+2.6	+.2	.0	+.5	-.6	-1.4
Montana	+2.5	-.4	+1.0	+3.9	-.5	-.3	-1.1	+1.2	+2.3	+1.7	+1.8	-.1	-.4	+.2	-.2	+.8	+.3	-.6	-1.0	-2.9	-3.7
Nebraska	+3.4	-.3	+2.6	+3.9	+.7	+.4	-.4	+2.8	+3.1	+.6	+1.7	+.3	+1.0	-.2	-.3	+2.4	+.3	+.3	-.2	-1.5	-2.3
Nevada	+1.8	+.1	+.6	+4.6	+1.0	+2.4	+.8	+.9	+1.9	+2.7	+.6	+1.0	+2.0	-1.0	+.5	+1.3	+1.5	-.6	-.8	+.7	-5.6
New Hampshire	+1.5	+.6	-.5	-1.4	-1.4	-.8	+.7	+1.0	-1.1	-1.9	+.1	+.6	-1.1	.0	+.5	+.9	+.4	-.7	+2.6	-.6	+.9
New Jersey	+2.4	+1.4	+.9	-.4	-.4	+.3	+1.0	+1.3	+1.0	-1.9	+1.0	+.6	.0	+.5	+.6	+1.9	+.5	+.3	+3.1	+.2	+1.2
New Mexico	-.5	-1.0	+.3	+2.4	.0	.0	-.2	-.1	.0	+.2	-.7	-.1	+1.0	-.9	+.1	+.9	.0	+.4	-.5	+1.8	+.5
New York	+2.5	+1.3	+1.3	-.4	-.6	+.2	+1.1	+1.6	+.5	-1.8	+1.2	+.8	-.8	+.4	+.3	+1.6	+.4	+.2	+2.6	-.3	+.2
North Carolina	+1.0	+1.2	+1.8	+.3	+.1	+.2	+.1	+1.1	+1.2	-1.5	+.6	+.1	+.1	.0	+.7	+.5	-.6	+.8	+2.2	+.5	+.5
North Dakota	+5.3	+.4	+1.5	+3.8	-.2	-.8	-.5	+2.3	+2.3	+1.4	+2.6	+1.3	+.2	+1.4	-.6	+1.2	+.5	+.4	+.2	-4.3	-3.7
Ohio	+3.0	+1.4	+2.0	+1.0	+.1	+.4	-.1	+2.4	+1.9	-1.2	+1.8	+.7	-.3	+.9	-.2	+1.9	-.2	+.5	+2.7	-.7	.0
Oklahoma	+1.6	+.1	+2.5	+2.5	+.3	+1.3	-.3	+2.3	+2.2	-1.1	+.5	-.3	+.5	+.4	-.6	+2.0	-.1	-.9	-.9	-.9	-.6
Oregon	+1.1	-.2	-.8	+3.1	-.4	+.5	-.3	+.5	+1.1	+1.8	+1.4	+.2	-.2	-.2	-.3	-1.0	+.2	-1.7	-1.0	-.6	-.5
Pennsylvania	+2.6	+1.4	+1.5	+.4	.0	+.2	+.5	+1.6	+1.5	-1.6	+1.1	+.3	-.7	-.2	-.5	+.9	-.6	-.3	+2.0	-.9	+.1
Rhode Island	+2.5	+1.3	+.7	-.2	+.1	+.4	+1.8	+1.4	+.3	-1.6	+.6	+.5	-.4	+.5	+.2	+1.0	+.3	-.3	+3.0	+.5	+2.0
South Carolina	+.8	+1.5	+1.8	+.2	+.2	+.2	-.2	+1.0	+1.2	-1.6	+.2	+.2	-.2	-.1	+.9	+1.0	-.7	.0	+1.1	-.2	-.1
South Dakota	+4.5	-.3	+2.5	+4.1	+.9	-.4	-.9	+2.4	+3.0	+.6	+2.4	+.6	+.4	-.1	-.6	+1.8	+.2	+.2	-.1	-3.4	-3.5
Tennessee	+2.1	+1.5	+2.2	+1.1	+.8	+.9	+.2	+2.0	+1.4	-1.6	+1.4	+.2	+.3	+.8	+.3	+1.7	-.5	+.1	+1.1	-.6	.0
Texas	+.1	-.6	+2.1	+1.8	+.3	-.7	-.4	+1.1	+.8	-1.5	-.5	-.9	-.3	-.2	+.1	+.7	-.8	-.3	-1.3	-.2	+1.0
Utah	+.2	-1.5	-.2	+4.2	+.7	+1.1	-.4	+.6	+.9	+2.2	-.2	-.7	+1.5	-1.3	-.4	+.7	+.3	-.8	-1.1	+.6	-.3
Vermont	+2.0	+1.2	+.9	-.6	-1.9	-.1	+1.5	+1.4	-.5	-1.3	+.6	+1.0	-1.4	-.1	+.5	+.8	+.5	.0	+2.2	+.1	+.8
Virginia	+1.9	+1.6	+1.7	+.3	-.5	+.1	-.2	+1.1	+1.3	-1.6	+.9	+.5	+.3	+.1	+.5	+1.1	-.6	+.1	+1.7	-.2	+.4
Washington	-.4	-1.3	-1.6	+2.3	-.6	.0	-.7	+.3	+.9	+2.0	+2.1	+.6	-.3	+.2	-.2	-.5	+.4	-2.5	-1.4	-2.0	-1.0
West Virginia	+1.7	+1.0	+1.4	+.5	.0	+.3	-.1	+1.5	+1.4	-1.6	+.4	.0	-.5	.0	.0	+1.4	-.4	+.1	+2.2	-.3	+.1
Wisconsin	+.7	-.1	+.9	+1.2	-.5	-1.3	-.7	+1.8	+1.7	-.8	-2.4	+.5	-.9	+1.7	-.6	+1.9	+.4	+.8	+1.8	-2.3	-2.3
Wyoming	+1.3	-1.4	+1.3	+3.9	+.3	+.5	-.5	+1.1	+1.6	+1.7	+1.1	-.2	+1.6	-.5	-.2	+2.1	+.8	+.4	+.7	-.2	-1.3

AVERAGE PRECIPITATION

Table 4

YEAR 1951

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	4.07	3.10	9.10	5.15	1.45	4.84	4.34	2.42	5.77	1.85	3.62	7.48	53.19
Arizona	1.32	.48	.50	1.42	.54	T	1.40	4.14	.53	1.34	.90	1.90	14.47
Arkansas	5.43	5.32	2.40	4.33	1.93	6.93	5.83	2.75	4.61	4.55	5.13	3.76	52.97
California	4.04	2.49	1.36	1.48	.95	.11	.08	.39	.12	1.81	3.27	7.13	23.23
Colorado	1.10	.71	.65	1.49	1.83	1.75	1.41	2.41	.79	1.34	.89	2.02	16.39
Connecticut	3.61	5.00	5.96	3.36	3.98	3.25	3.38	4.27	2.36	4.14	7.34	5.07	51.72
Delaware	2.43	2.99	3.46	2.63	3.63	4.45	4.94	3.13	2.29	2.83	6.47	5.38	44.63
Florida	.93	1.85	3.21	4.21	2.45	4.60	7.33	5.50	7.18	4.73	4.10	2.58	48.67
Georgia	1.72	2.01	6.03	3.67	1.47	4.44	5.19	3.04	5.68	1.96	4.10	[illegible]	45.39
Idaho	2.13	2.19	1.39	1.06	1.29	.92	.62	1.37	.40	2.73	1.82	[illegible]	19.20
Illinois	2.34	4.03	3.53	3.45	3.26	6.17	4.63	3.71	3.49	3.13	3.43	[illegible]	43.68
Indiana	2.36	3.43	3.57	3.44	3.42	4.63	3.89	2.60	2.72	2.74	[illegible]	[illegible]	41.73
Iowa	.63	2.48	4.20	4.96	5.09	6.11	4.45	6.21	2.52	3.28	[illegible]	.99	42.22
Kansas	.76	1.62	1.43	2.53	6.43	9.55	6.60	4.30	5.07	1.97	[illegible]	.30	41.58
Kentucky	7.54	4.53	4.99	3.30	2.66	5.03	2.85	3.17	4.31	[illegible]	[illegible]	7.43	54.67
Louisiana	6.76	2.90	6.77	3.14	1.79	4.07	5.53	1.95	6.69	.86	2.73	5.87	49.06
Maine	3.02	4.10	3.95	5.90	3.10	2.32	6.33	4.15	2.83	3.70	6.49	4.77	50.66
Maryland	2.39	3.04	3.14	3.55	2.84	7.59	3.33	2.31	2.51	1.96	5.41	4.73	42.80
Massachusetts	3.22	4.57	4.70	3.04	4.07	2.99	3.69	3.76	2.37	4.27	6.51	4.75	47.94
Michigan	1.94	2.09	2.60	3.52	2.47	3.73	3.95	3.86	3.63	4.31	2.77	2.68	37.55
Minnesota	.53	1.30	2.52	1.96	2.99	4.78	3.27	5.15	3.49	2.25	1.21	1.55	31.00
Mississippi	7.08	4.74	9.18	4.71	1.04	5.39	4.69	1.85	4.73	1.26	3.29	7.95	55.91
Missouri	2.28	4.52	3.37	3.05	3.34	8.95	5.59	5.14	5.29	3.77	3.75	1.70	50.75
Montana	.77	.83	.87	1.07	1.57	2.35	1.39	2.44	1.54	1.62	.54	1.32	16.31
Nebraska	.32	1.00	1.34	2.94	4.74	5.79	4.07	4.26	3.34	1.67	.34	.71	30.52
Nevada	.86	.63	.42	1.12	.49	.16	.51	.56	.20	.83	.78	1.69	8.25
New Hampshire	2.39	5.03	4.74	4.41	3.23	2.87	5.57	3.79	3.52	3.75	5.82	4.25	49.37
New Jersey	3.30	4.32	5.39	3.01	4.17	3.80	4.26	3.03	1.84	4.42	6.81	5.40	49.75
New Mexico	.61	.37	.53	.66	1.01	.36	1.66	2.30	.28	.89	.42	.76	9.85
New York	2.73	3.70	4.31	3.47	2.37	4.23	4.71	2.55	3.25	2.44	4.54	4.02	42.32
North Carolina	1.54	2.28	4.26	3.95	1.54	5.55	5.24	3.72	2.89	1.91	3.71	4.59	41.18
North Dakota	.57	.80	.57	.81	1.15	2.89	1.94	4.09	1.71	1.04	.28	.73	16.58
Ohio	4.12	3.27	4.36	3.21	3.34	4.59	2.60	1.30	3.04	1.89	4.14	4.81	40.67
Oklahoma	1.37	3.12	1.37	2.06	5.46	7.11	2.99	1.63	4.06	3.62	2.17	.32	35.28
Oregon	5.78	3.67	3.27	.97	1.75	.51	.21	.34	.98	4.49	4.27	5.34	31.58
Pennsylvania	3.74	3.55	4.51	3.75	2.72	5.85	3.94	1.70	2.69	2.22	5.06	4.65	44.38
Rhode Island	4.09	3.53	5.04	3.15	4.52	2.14	1.31	3.18	1.57	3.29	8.20	5.11	45.13
South Carolina	1.35	1.57	4.81	3.22	.98	4.66	5.70	3.10	4.70	1.26	2.90	4.46	38.71
South Dakota	.18	.65	1.12	1.18	2.94	4.61	2.34	3.75	1.71	2.10	.25	1.37	22.20
Tennessee	7.70	4.99	5.84	4.85	1.41	6.27	4.01	2.00	4.38	2.83	6.08	8.36	58.72
Texas	1.02	1.35	1.38	.99	3.55	3.18	1.53	1.21	3.44	1.35	.87	.73	20.60
Utah	1.09	.75	.75	1.65	1.23	.38	.98	1.92	.28	1.47	1.42	2.57	14.49
Vermont	2.23	4.30	3.83	4.15	2.67	3.11	5.23	3.42	3.39	3.11	4.58	3.88	43.90
Virginia	1.77	2.52	3.79	3.82	2.62	6.27	3.87	3.11	1.89	1.60	4.63	4.51	40.40
Washington	5.93	5.11	3.37	.71	1.75	1.08	.34	.94	1.67	1.93	4.44	4.45	34.72
West Virginia	3.81	3.42	4.96	4.13	4.12	6.55	2.97	2.75	3.17	1.33	4.31	4.83	46.35
Wisconsin	.85	1.69	3.31	3.97	3.22	4.72	5.12	4.48	3.79	3.95	1.91	1.23	38.24
Wyoming	.87	.56	.82	1.22	1.67	1.89	1.78	1.47	1.00	1.56	.47	1.01	14.32
Alaska	1.26	1.51	1.20	1.41	.83	1.95	2.07	3.78	3.25	1.85	1.94	1.68	22.73
Hawaii	6.43	9.73	16.94	3.99	2.65	2.94	4.47	6.46	3.47	9.49	7.01	9.64	83.22
Puerto Rico	2.57	.97	1.08	5.08	8.60	5.33	7.20	6.96	10.09	7.74	5.04	4.99	65.65

PERCENT OF NORMAL PRECIPITATION

Table 5

YEAR 1951

Section	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama	84	60	157	111	37	113	78	52	171	72	105	151	100
Arizona	133	38	51	218	169	0	84	196	38	165	127	145	115
Arkansas	122	148	50	88	38	169	156	77	139	141	135	90	109
California	102	65	47	95	119	35	73	229	30	166	160	194	111
Colorado	118	70	47	86	105	121	70	126	57	109	107	215	99
Connecticut	95	144	148	92	104	92	86	104	61	118	191	133	114
Delaware	68	93	91	76	99	117	105	65	67	91	219	157	102
Florida	34	61	96	139	63	69	98	78	95	112	185	92	90
Georgia	42	43	121	96	43	100	88	58	148	72	153	146	91
Idaho	106	127	83	77	81	69	102	236	41	192	93	167	112
Illinois	100	210	110	97	79	153	143	110	96	117	131	117	119
Indiana	112	143	96	96	83	117	117	78	83	99	138	175	109
Iowa	62	228	249	190	129	135	124	165	63	143	76	91	135
Kansas	115	165	101	99	171	241	224	138	173	97	73	35	156
Kentucky	165	129	105	81	67	119	68	85	147	76	195	193	119
Louisiana	138	65	135	67	38	89	94	40	171	27	66	110	87
Maine	90	141	114	188	96	67	186	128	79	104	179	145	126
Maryland	72	104	89	103	77	188	77	52	74	65	200	149	102
Massachusetts	88	136	121	86	119	85	105	104	64	127	176	132	112
Michigan	108	127	127	146	74	109	144	132	110	163	110	139	122
Minnesota	72	173	210	96	95	117	98	157	124	122	103	204	123
Mississippi	134	99	152	97	24	128	93	45	151	50	86	151	104
Missouri	99	215	103	75	70	186	158	136	131	128	137	78	125
Montana	102	130	96	96	74	85	95	218	115	160	64	169	110
Nebraska	58	145	118	124	138	154	132	158	159	114	44	106	137
Nevada	81	62	46	142	63	31	131	112	48	128	116	180	95
New Hampshire	80	188	141	143	99	79	149	108	95	120	171	139	125
New Jersey	91	126	143	85	109	100	90	65	50	126	200	150	109
New Mexico	105	54	70	77	81	31	73	97	15	79	69	101	69
New York	94	138	140	115	67	116	119	69	94	75	145	135	108
North Carolina	41	58	101	111	39	119	87	68	71	58	133	121	83
North Dakota	119	170	73	57	51	82	79	198	112	100	46	152	97
Ohio	140	136	130	99	115	115	69	39	103	76	151	177	110
Oklahoma	88	194	60	58	113	177	107	56	129	122	107	18	106
Oregon	149	111	113	47	100	37	48	77	82	202	110	125	114
Pennsylvania	118	127	128	104	68	140	91	42	79	69	69	150	105
Rhode Island	103	101	125	84	132	72	45	86	47	96	217	134	106
South Carolina	39	39	121	99	28	100	95	54	116	44	123	126	82
South Dakota	33	118	101	57	103	128	97	178	110	174	38	269	116
Tennessee	152	110	109	111	34	146	89	50	106	100	164	183	116
Texas	65	87	107	38	103	112	62	51	119	55	47	36	76
Utah	93	60	55	133	113	54	102	171	27	121	153	234	110
Vermont	81	173	131	142	81	84	135	97	91	97	141	141	114
Virginia	58	83	105	117	69	150	82	70	55	54	182	145	91
Washington	137	145	112	33	92	67	52	132	102	177	94	89	109
West Virginia	105	109	127	117	102	145	64	68	105	48	151	147	107
Wisconsin	69	141	204	161	92	113	150	130	102	166	101	98	126
Wyoming	99	66	73	74	85	109	135	129	83	138	60	129	98

PERCENT OF ANNUAL PRECIPITATION

Table 6

(For past years)

Section	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Alabama	80	119	90	103	92	114	109	91	111	101	86	100	89	112	106	124	114	125	106	98	100
Arizona	142	98	86	76	112	103	94	92	93	125	153	69	90	99	82	100	69	77	97	54	115
Arkansas	97	105	101	88	118	72	114	100	104	93	96	103	72	114	139	121	84	115	117	122	109
California	102	65	84	75	92	84	121	125	66	150	151	100	100	100	114	73	57	88	70	124	111
Colorado	85	86	92	66	96	97	88	117	65	102	136	113	86	100	102	102	110	93	102	74	99
Connecticut	90	107	99	116	79	117	120	133	94	104	81	115	85	98	112	84	112	103	85	97	114
Delaware	93	112	119	124	124	115	115	111	104	99	77	102	88	101	125	90	95	131	92	92	102
Florida	81	100	104	99	98	108	110	81	102	98	110	100	90	100	104	103	137	118	102	91	90
Georgia	75	116	83	97	89	118	105	84	98	94	85	106	94	108	108	101	119	127	96	89	91
Idaho	83	108	103	89	68	91	110	108	76	121	119	111	92	89	121	114	101	118	86	115	112
Illinois	103	99	95	90	114	82	100	110	97	78	108	112	95	92	125	109	101	100	112	117	119
Indiana	98	109	104	76	100	86	117	105	99	83	83	105	95	86	127	92	102	105	115	138	109
Iowa	111	102	79	85	104	82	87	114	79	97	116	103	98	117	109	109	111	89	89	93	135
Kansas	96	88	82	74	106	68	77	101	75	95	137	123	91	139	112	105	102	109	120	101	156
Kentucky	93	109	112	82	127	84	110	102	105	86	74	110	83	89	113	101	92	111	114	139	119
Louisiana	94	111	97	105	101	81	104	89	91	132	107	101	92	109	109	130	112	100	109	101	87
Maine	100	99	102	99	95	123	105	107	89	100	76	100	106	95	115	92	91	93	89	107	126
Maryland	92	112	117	107	112	105	124	96	103	104	78	115	81	101	120	89	92	132	99	102	102
Massachusetts	101	107	115	105	92	119	114	129	88	102	76	110	90	97	117	95	95	106	81	93	112
Michigan	98	109	99	84	94	89	102	103	99	107	106	115	105	94	116	90	108	93	105	114	122
Minnesota	88	85	81	80	101	72	102	112	86	100	115	114	107	117	108	111	100	89	106	103	123
Mississippi	98	127	94	100	97	83	104	92	101	114	87	91	78	114	111	123	109	123	114	112	104
Missouri	100	94	93	87	119	73	92	101	94	80	104	114	94	96	132	109	98	98	119	102	125
Montana	67	107	107	77	72	77	87	109	83	99	114	110	98	101	97	113	106	110	83	107	110
Nebraska	85	91	90	63	100	64	78	98	72	77	108	111	76	121	100	109	103	94	112	100	137
Nevada	89	92	74	79	96	114	99	131	94	123	149	82	109	95	126	108	64	72	89	95	95
New Hampshire	104	108	114	107	102	131	123	125	98	111	83	109	112	101	125	105	103	100	93	106	125
New Jersey	81	103	109	100	93	104	104	115	94	106	82	111	86	103	115	87	101	116	87	97	109
New Mexico	126	112	89	70	102	93	104	101	91	104	195	108	80	101	69	93	76	93	107	74	69
New York	97	107	96	89	97	102	111	106	87	103	81	112	100	95	125	94	110	103	87	104	108
North Carolina	[illegible]	106	79	108	97	121	106	97	99	91	78	104	88	108	110	99	103	114	109	92	83
North Dakota	88	100	79	56	105	52	99	90	83	102	136	110	107	125	87	97	106	102	95	106	97
Ohio	101	98	102	70	107	88	118	104	99	101	83	101	94	88	118	95	108	111	99	126	110
Oklahoma	96	103	93	83	112	69	86	101	81	103	143	121	88	111	127	108	96	97	118	104	106
Oregon	93	101	107	98	78	88	132	100	79	112	113	118	91	76	121	104	102	132	86	135	114
Pennsylvania	89	93	108	93	96	101	111	96	88	104	81	114	90	96	117	94	98	109	91	113	105
Rhode Island	94	122	106	92	89	120	103	112	90	94	76	106	72	95	97	88	112	109	82	93	106
South Carolina	76	112	75	93	89	119	108	85	97	90	93	99	92	101	116	94	116	124	102	88	82
South Dakota	65	108	91	65	81	49	89	83	74	80	126	121	88	114	91	144	98	104	90	94	116
Tennessee	87	120	103	95	100	95	113	100	100	86	74	102	84	109	116	109	89	116	115	127	116
Texas	94	110	84	86	121	99	86	87	79	113	140	107	82	116	108	122	86	80	114	83	76
Utah	75	100	79	71	81	127	110	113	86	118	155	94	105	112	136	125	124	96	111	78	110
Vermont	104	104	102	101	100	121	117	120	96	109	83	107	110	98	133	104	111	104	91	99	114
Virginia	91	107	94	109	111	108	127	101	99	106	74	116	86	107	113	93	96	125	108	100	91
Washington	122	128	137	111	84	94	125	85	93	104	98	96	79	74	112	108	105	128	87	118	109
West Virginia	89	102	113	87	119	98	116	99	101	104	84	113	93	104	117	85	85	115	105	118	107
Wisconsin	97	84	89	100	99	83	90	136	86	107	111	115	96	95	115	97	98	79	92	101	126
Wyoming	81	93	85	76	86	92	109	107	72	102	127	108	87	109	122	109	117	89	96	96	98

Table 7

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
ALABAMA														
Demopolis Lock 4	EVAP	-	-	4.09	B5.36	6.82	B6.27	6.42	6.74	4.45	4.04	2.25	B2.77	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	2116	-	1096	571	396	474	645	1090	1601	2265	-
Fairhope	EVAP	2.07	2.35	B4.07	B5.40	B7.41	B6.50	6.36	B6.54	B3.75	4.20	B2.49	-	-
	DEP	+.09	-.01	+.43	+.49	+1.29	+.30	+.48	-.07	+.58	-.52	-.12	-	-
	WIND	1047	906	1065	992	-	657	371	419	178	426	792	-	-
Martin Dam	EVAP	-	-	4.15	5.45	8.84	7.73	8.29	8.59	5.81	5.27	2.17	2.18	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	1814	1591	1465	895	931	1039	1234	1416	1213	1237	-
ARIZONA														
Bartlett Dam	EVAP	B5.20	B5.94	8.21	9.34	13.94	17.40	18.14	B15.84	12.94	9.57	B5.38	3.30	125.20
	DEP	1.11	1.44	1.11	-1.09	-.61	.37	.91	1.34	.24	.32	-.68	-.89	3.57
	WIND	2145	1865	2170	2120	2215	2032	1928	1985	1975	2130	1825	1960	24350
Davis Dam	EVAP	B3.96	4.83	10.25	8.87	B10.54	12.48	12.73	B11.02	8.83	7.27	4.81	2.89	98.48
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1082	1218	1569	858	687	729	660	565	588	911	997	1119	10983
Many Farms	EVAP	-	-	-	-	-	-	-	-	11.54	8.06	-		
	DEP	-	-	-	-	-	-	-	-	-	-	-		-
	WIND	-	-	-	-	-	-	-	-	2380	2660	2470	3270	-
Mesa Exp. Farm	EVAP	2.67	3.23	5.95	B7.95	9.09	10.85	B10.50	10.05	7.68	6.37	4.07	2.31	80.72
	DEP	-.16	-.26	.28	.41	-1.09	-.45	-.73	.68	.23	.98	.53	-.24	.18
	WIND	781	870	1193	1235	806	656	659	722	448	696	739	878	9683
Pierce Ferry	EVAP	2.77	4.02	8.15	11.53	15.53	19.44	-	15.37	14.40	8.26	.98	2.44	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Roosevelt	EVAP	-	3.32	6.98	8.32	11.87	15.52	16.68	B13.20	9.51	5.82	2.83	1.64	-
	DEP	-	.66	2.08	1.16	1.45	3.27	4.40	2.94	1.41	.49	-.04	-.17	-
	WIND	-	1750	2410	2370	2350	2540	2670	2100	1250	1370	1190	1370	-
Sacaton	EVAP	B4.00	4.43	7.62	9.10	13.50	14.63	B14.17	10.49	8.40	6.85	3.64	2.70	99.18
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1136	1350	1948	1698	1549	1286	1177	700	447	633	439	869	13232
San Carlos Res.	EVAP	B2.58	3.24	B6.31	7.88	11.76	15.06	15.17	B11.29	9.80	6.50	2.85	1.60	84.04
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1107	1133	1313	1292	1183	1622	1736	1324	844	1006	977	1058	14595
Sierra Ancha	EVAP	2.56	2.30	4.89	5.53	8.42	10.87	11.62	B9.36	7.51	5.84	B2.96	B1.76	73.62
	DEP	.60	-.06	.62	-1.33	-.72	.04	1.26	.68	-.22	.19	-.38	-.45	.23
	WIND	457	542	748	629	627	543	507	402	362	536	404	386	6143
Tucson Univ. of Arizona	EVAP	3.34	4.14	7.14	8.64	12.08	13.84	13.86	11.19	10.66	7.15	3.58	2.43	98.05
	DEP	1.02	1.05	1.34	.15	.86	1.11	2.14	1.81	2.65	1.38	.25	1.34	15.10
	WIND	807	1007	1133	1155	1040	794	1096	1086	922	953	911	899	11866
Winkleman 9S	EVAP	-	-	-	-	-	B12.95	11.25	B9.02	B8.71	B7.42	B3.89	B2.44	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	B1246	1210	968	847	557	690	692	739	-
Yuma Citrus	EVAP	3.71	4.47	7.11	8.51	11.00	12.74	13.63	11.57	9.16	7.37	4.13	2.96	96.36
	DEP	-.28	-.51	-.91	-1.94	-2.67	-2.12	-2.59	-2.73	-2.30	-.89	-1.23	-.88	-19.05
	WIND	768	751	981	927	774	667	773	781	322	561	583	766	8654
ARKANSAS														
Hope	EVAP	B2.36	-	5.12	5.46	6.42	B6.05	B6.77	B7.67	B5.43	B4.05	-	-	-
	DEP	.02	-	.74	-.08	.01	-1.05	-1.28	.04	-.54	-.63	-	-	-
	WIND	1401	-	1680	1587	952	654	548	595	783	B736	1151	1322	-
Nimrod Dam	EVAP	-	-	-	5.09	7.52	B6.71	B7.35	B7.40	B4.38	B4.03	-	-	-
	DEP	-	-	-	-	1.56	-.45	-.52	.22	-1.14	-.21	-	-	-
	WIND	-	-	-	1801	929	459	243	342	214	492	-	-	-
Norfolk Dam	EVAP	-	-	-	B5.00	7.16	6.77	B6.90	7.00	B4.35	B4.23	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	1828	1258	1012	887	733	791	1114	-	-	-
Russellville	EVAP	B1.31	-	3.42	4.46	6.89	5.74	6.94	B6.77	4.60	B3.67	B1.59	-	-
	DEP	-.48	-	-.44	-.62	.86	-1.05	-.89	-.66	-.95	-.39	-.46	-	-
	WIND	801	-	1196	988	531	308	365	381	449	457	636	786	7630
Stuttgart 9ESE	EVAP	-	-	3.41	4.23	6.35	5.23	B5.31	6.08	-	3.19	-	-	-
	DEP	-	-	-.01	-.52	.44	-1.87	-2.11	-.98	-	-.49	-	-	-
	WIND	-	-	2660	2120	1150	1090	640	730	-	B827	-	-	-
CALIFORNIA														
Backus Ranch	EVAP	3.11	4.27	7.73	8.10	13.02	16.89	18.70	17.03	13.48	9.67	3.65	2.42	118.07
	DEP	.07	.56	1.59	-1.32	-.49	.40	-.09	-.77	.73	2.05	-.73	-.50	1.50
	WIND	1528	1341	2269	2251	3424	3265	2563	2394	2015	2310	996	1890	26246
	MAX	55.2	58.0	-	68.8	79.1	87.4	83.5	88.8	87.6	69.2	60.3	49.1	-
	MIN	32.6	35.4	-	49.3	51.5	56.9	61.5	59.4	57.4	48.1	38.6	32.9	-
Beaumont WB	EVAP	3.27	3.60	6.93	5.25	8.36	9.70	12.10	11.98	10.32	8.72	5.66	B2.84	88.73
	DEP	-1.06	.01	1.83	-.55	-.38	-.75	-1.67	-.28	.32	1.58	-.12	-1.22	-2.29
	WIND	2029	1902	2579	1671	1714	1374	1209	1550	1357	2374	2415	2403	22577
	MAX	52.2	56.7	64.7	69.0	80.1	85.1	92.5	90.7	88.6	74.5	59.8	49.9	72.0
	MIN	34.8	33.2	36.7	43.0	47.0	51.7	58.6	57.3	54.7	47.9	39.6	34.6	44.9
Boca	EVAP	-	-	-	-	6.77	8.98	11.12	8.86	7.03	B3.57	-	-	-
	DEP	-	-	-	-	-.21	.70	.56	-.62	.03	-.47	-	-	-
	WIND	1939	1334	-	1780	1410	817	886	773	531	717	1494	2055	-
Camp Pardee	EVAP	B.67	.77	2.20	3.54	6.81	10.00	11.32	10.19	7.36	3.81	1.10	.62	58.39
	DEP	-.07	-.33	-.04	.01	-.08	.74	-.20	.18	-.17	-.11	-.19	-.08	-.16
	WIND	821	616	612	629	882	1092	1092	1002	889	851	663	1036	10185
Chico Exp. Sta.	EVAP	-	-	-	-	B9.10	11.01	12.13	10.75	9.27	4.84	B1.72	B4.61	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	B1397	1586	1542	1401	986	1165	1381	1966	-
Chula Vista	EVAP	2.69	3.40	5.66	5.85	6.92	7.69	7.96	7.22	5.00	5.10	3.59	2.49	63.57
	DEP	-.13	.16	.76	.06	.14	.71	.42	.06	-.97	.36	-.07	-.30	1.20
	WIND	2302	2221	3025	3527	3317	3592	3078	3040	2605	2197	1780	2195	32879
Davis Agr. College	EVAP	.69	1.33	5.33	5.92	8.50	11.17	11.21	10.02	8.04	B5.34	B1.99	B1.49	71.03
	DEP	-.60	-.49	1.69	.41	.30	1.48	.46	.33	.04	.34	-.44	.29	3.81
	WIND	2264	1501	2870	1914	1996	1989	1784	1602	1289	1491	1051	1786	21537
Fall River Mills Intake	EVAP	-	-	B3.51	5.53	7.04	10.54	12.93	10.91	8.10	3.09	1.34	-	-
	DEP	-	-	.50	.69	-.31	1.52	.85	.09	1.01	-.70	.10	-	-
	WIND	1496	794	2401	1990	2150	1818	2262	1961	1600	1473	1081	1506	20532

See reference notes at end of table.

TOTAL EVAPORATION AND WIND MOVEMENT

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
CALIFORNIA (Cont'd.)														
Friant Govt. Camp	EVAP	1.27	2.16	4.65	6.96	12.05	14.40	16.38	14.29	10.55	6.97	3.93	B1.30	94.91
	DEP	.02	.21	.97	1.29	1.77	.63	.54	.53	.71	1.25	1.33	.05	9.30
	WIND	969	916	1160	1254	1916	1750	1579	1331	1066	1200	1180	1478	15796
	MAX	-	-	70.6	76.8	83.2	88.3	90.8	87.7	84.1	72.6	61.6	50.1	-
	MIN	-	-	46.6	53.7	57.7	62.6	65.9	64.1	62.3	52.4	48.1	41.2	-
Lakeshore	EVAP	-	B1.34	4.09	B5.33	6.45	9.26	10.97	10.04	7.16	B2.56	B1.42	B1.09	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	471	285	822	443	267	330	397	391	288	412	421	550	5077
Lodi	EVAP	.84	1.43	3.73	5.88	8.49	10.02	10.07	8.32	6.78	4.10	1.41	.87	61.94
	DEP	-.18	-.41	.14	.10	-.38	-.67	-1.83	-2.00	-.96	-.34	-.59	-.13	-7.25
	WIND	1594	885	1334	1956	2335	2238	1145	1323	1146	1118	1023	1950	18047
Newark	EVAP	1.11	1.77	3.60	4.02	6.70	7.72	8.09	7.39	B5.71	4.68	2.07	B1.30	54.16
	DEP	-.25	-.13	.18	-1.03	-.49	-.55	-.66	-.34	-.89	.36	-.28	.04	-4.04
	WIND	1317	1051	1630	1949	2267	2370	2400	2209	1956	1836	1446	1825	22256
Oakdale, Woodward Dam	EVAP	-	1.49	B3.67	4.86	8.90	13.41	14.90	12.39	-	-	-	-	-
	DEP	-	-.27	.37	-.40	-.53	.95	.26	-.38	-	-	-	-	-
	WIND	4015	2265	3085	2930	3630	4950	4645	4040	-	-	2563	3897	-
Salt Springs PH	EVAP	-	-	B5.12	5.12	7.09	9.71	11.30	10.96	9.49	5.21	B2.50	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Shasta Dam	EVAP	B1.13	1.40	4.18	5.86	7.54	10.42	12.12	11.29	9.18	B4.62	2.83	B1.95	72.52
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1213	867	1631	1021	1200	1004	1074	1252	1771	2472	2667	3390	19562
Tahoe	EVAP	-	-	-	-	-	5.48	6.37	5.24	3.71	B1.23	-	-	-
	DEP	-	-	-	-	-	1.17	.88	-.48	-.47	-1.27	-	-	-
	WIND	1661	1387	2113	-	1073	164	32	75	32	347	985	1727	-
Turntable Creek	EVAP	B2.02	B1.99	B6.59	B6.92	B7.07	12.04	11.05	12.07	9.61	B5.50	B4.87	B5.02	84.75
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2413	1652	3087	1918	1992	1912	1926	2148	1938	2391	2478	3024	26879
COLORADO														
Bonny Dam	EVAP	-	-	-	-	-	-	-	10.46	7.96	B5.43	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	3781	3468	5161	5271	4850	3670	3130	3290	3750	3280	3270	3930	46851
Conejos 3NNW	EVAP	-	-	-	B6.31	B8.88	10.60	11.71	10.23	8.76	-	-	-	-
	DEP	-	-	-	-	.03	1.61	4.79	3.30	1.76	-	-	-	-
	WIND	3195	2166	3006	3490	3636	3517	2613	2343	2602	2995	1970	3308	34841
Estes Park	EVAP	-	-	-	-	B7.98	6.38	9.10	B7.25	7.19	3.98	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	6032	4675	4748	3486	3457	2175	2149	2013	2593	2920	4145	5800	44193
Fort Collins (a)	EVAP	-	-	-	B3.67	4.88	4.92	B7.03	B5.09	5.06	3.30	-	-	-
	DEP	-	-	-	-.72	.15	-.66	.14	-1.37	-.29	.22	-	-	-
	WIND	2226	1524	2456	2206	1679	1179	932	811	1062	998	1341	1654	18068
Grand Junction WB AP	EVAP	-	-	-	9.27	B12.84	B15.56	B18.11	13.72	12.10	6.71	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2325	3001	4515	4294	4534	4207	4094	4218	3625	3372	2776	2167	43128
Grand Lake 4SSW	EVAP	-	-	-	-	4.73	5.27	B7.76	5.78	5.20	1.63	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	1187	1951	1692	1192	1009	892	775	856	631	-	-	-
Green Mt. Dam	EVAP	-	-	-	-	B5.39	B4.96	7.60	5.60	5.12	B2.46	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2415	1929	2643	2231	1594	1293	1233	1083	1159	1172	1644	2445	20841
John Martin Dam	EVAP	-	-	-	-	9.01	8.67	10.58	9.97	7.44	B4.63	-	-	-
	DEP	-	-	-	-	-.18	-2.05	-1.65	-1.24	-1.43	-.59	-	-	-
	WIND	3120	2745	4430	4960	4270	3632	2605	2508	2797	2293	2139	2523	38022
Montrose 1	EVAP	1.38	1.69	4.04	5.31	7.78	8.87	10.16	7.99	7.84	4.73	B2.22	1.36	63.37
	DEP	.17	.21	1.01	.24	.62	-.06	.63	.71	1.64	1.23	.60	.10	7.10
	WIND	205	356	721	799	829	805	745	682	1198	1384	B791	1058	9573
Platoro Dam	EVAP	-	-	-	-	-	9.07	8.34	6.81	6.95	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	3260	2300	3540	3053	3085	3069	2399	2241	2605	-	-	-	-
Pueblo City Res.	EVAP	-	B2.75	5.54	5.91	B9.07	B9.50	11.21	9.56	8.04	4.98	1.94	-	-
	DEP	-	-.12	.35	-1.15	.63	-1.12	-.30	-.33	-.10	-.58	-1.28	-	-
	WIND	3800	2660	3740	4240	3730	3520	2960	2780	2700	2280	2580	4290	39280
San Luis Lake 3W	EVAP	-	-	-	B6.09	9.34	10.29	11.17	8.49	8.22	5.33	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	3080	1890	3320	3090	3470	2880	2370	2190	2060	2380	1890	2730	31350
Sugar Loaf Res.	EVAP	-	-	-	-	-	B6.88	7.89	-	5.62	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	1433	1142	806	966	B1229	-	-	-
Vallecito Dam	EVAP	-	-	-	B3.86	5.67	B8.09	9.13	6.50	6.73	3.96	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	702	678	1040	1029	966	1069	965	791	895	935	690	-	-
Wagon Wheel Gap 3N	EVAP	-	-	-	-	-	9.13	8.48	6.08	6.67	-	-	-	-
	DEP	-	-	-	-	-	.54	1.23	.30	1.20	-	-	-	-
	WIND	-	2902	2084	2320	2300	2081	1394	B934	1423	1450	940	917	18745
FLORIDA														
Belle Glade Exp. Sta.	EVAP	3.14	B3.75	B5.58	B5.54	8.01	B8.29	6.10	5.97	6.05	B5.41	4.02	3.74	65.60
	DEP	-.08	-.30	-.21	-1.10	+.76	+2.01	-.22	-.39	+.72	+.38	+.25	+.73	+2.55
	WIND	-	-	5426	-	5271	-	-	-	-	-	-	-	-
Belle Glade Hrcn Gate 4 (b)	EVAP	3.15	3.76	5.24	4.73	6.41	5.89	3.29	4.08	B4.30	B4.07	3.46	3.31	51.69
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Clewiston U.S. Engrs. (b)	EVAP	3.42	3.80	5.35	5.47	7.69	7.55	4.77	4.96	5.13	B4.39	3.84	3.05	59.42
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	159	249	-	-	-	-	-	-	-	-	-	-	-
Hialeah	EVAP	4.27	4.57	6.38	B6.36	9.11	8.19	B7.23	B7.17	7.41	B5.42	B5.28	-	-
	DEP	+.82	+.21	+.31	-.81	+1.43	+1.28	+.59	+.39	+1.69	+.28	+1.25	-	-
	WIND	1122	1662	1746	1802	-	-	1020	808	1241	1124	1477	-	-
Lake Placid	EVAP	-	-	-	-	7.38	7.20	B6.36	6.80	B5.96	B4.90	3.32	3.29	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	1068	727	523	573	656	727	794	976	-

See reference notes at end of table.

Table 7 --Continued

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
FLORIDA (Cont'd.)														
Loxahatchee	EVAP	2.84	3.78	4.58	B5.57	B7.08	B6.60	B5.32	B4.98	B4.48	B3.78	2.71	2.13	53.85
	DEP	-.66	-.40	-1.17	-1.48	-.44	-.25	-.86	-1.73	-1.61	-1.50	-1.25	-1.01	-12.36
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Moore Haven Lock 1 (b)	EVAP	3.24	4.26	6.20	B7,33	B8.69	B8.18	B6.05	6.49	7.40	B5.83	4.65	4.22	72.54
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1110	1767	2018	2116	2356	1621	1192	1255	1750	2296	2284	2265	22030
Okeechobee Hrcn Gt 6 (b)	EVAP	3.03	B3.14	5.37	5.09	7.50	7.48	-	6.41	7.01	5.10	4.89	3.58	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Orlando Water Plant	EVAP	2.65	B4.02	5.06	5.48	7.56	6.62	B6.96	7.24	B6.39	B4.64	B3.00	2.08	61.70
	DEP	-.23	+.24	-.29	-1.08	-.44	-.25	+.13	+1.18	+1.25	-.18	-.43	-.59	-.69
	WIND	914	1186	1020	1247	1540	826	581	670	739	1239	1218	985	12165
Port Mayaca S.L.Cnl (b)	EVAP	3.92	4.27	6.26	6.39	8.90	8.67	5.51	6.24	5.80	B4.24	4.30	3.47	67.97
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Tamiami Trl 40 Mi Bend	EVAP	3.43	4.21	5.74	B5.96	8.14	7.50	B5.51	6.67	5.28	B5.67	4.42	3.84	66.37
	DEP	-.04	-.05	-.20	-.86	+.89	+.81	-.87	+.22	-.56	+.36	+.40	+.76	+.86
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
GEORGIA														
Ailey	EVAP	-	B3.26	B4.86	B5.35	B7.62	B8.24	-	B7.34	B5.00	B3.75	B2.19	B1.98	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	792	1505	1126	690	358	462	440	528	639	717	878	-
Athens WB Airport	EVAP	B3.57	-	B3.94	B6.51	9.19	7.75	-	8.71	B5.56	4.20	B2.10	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2865	-	2979	2580	2292	1651	-	1559	1444	1721	1779	-	-
Experiment	EVAP	2.63	2.48	4.13	B6.74	B8.20	B7.78	7.00	B6.81	B4.80	3.78	B2.05	B1.74	58.14
	DEP	+.55	-.06	-.26	+.93	+.86	+.02	-.03	+.53	-.62	-.43	-.53	-.21	+.75
	WIND	2056	1730	2645	2665	1995	1540	1107	986	673	754	1165	1731	19047
Hoggards Mill	EVAP	2.08	2.96	4.28	5.28	7.57	7.71	7.54	7.34	5.57	4.80	B2.19	1.97	59.29
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	622	636	837	658	658	476	428	305	369	592	571	636	6788
Rome WB Airport	EVAP	B1.49	2.26	B3.49	5.46	7.95	7.16	-	6.03	5.60	B3.93	B1.72	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1680	1452	1971	1806	1174	723	-	417	502	-	858	1168	-
Tifton 2N	EVAP	2.63	2.68	B4.09	5.12	7.97	B7.78	B7.67	B6.18	4.47	B4.54	B2.48	B3.18	58.79
	DEP	+.24	-.13	-.66	-.90	+.43	+.75	+1.16	+.19	-.45	+.49	-.20	+1.24	+2.16
	WIND	1137	1093	1440	1116	1116	978	981	456	542	1050	1142	1482	12533
IDAHO														
Aberdeen Exp. Sta.	EVAP	-	-	-	-	-	B7.25	7.78	5.54	-	-	-	-	-
	DEP	-	-	-	-	-	-.16	-1.08	-2.30	-	-	-	-	-
	WIND	3695	2683	3101	2760	2875	1846	1400	1091	1568	2344	2359	3183	28905
Arrowrock Dam	EVAP	-	-	-	-	5.76	8.10	10.82	8.42	6.60	-	-	-	-
	DEP	-	-	-	-	-.63	.84	.18	-1.05	.80	-	-	-	-
	WIND	-	-	-	-	1792	1414	1120	948	1014	-	-	-	-
Blackfoot Dam	EVAP	-	-	-	-	-	B7.99	10.03	7.86	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	B2577	2272	1967	-	-	-	-	-
Lifton Pumping Sta.	EVAP	-	-	-	B4.94	5.94	7.29	9.06	6.99	5.53	2.80	-	-	-
	DEP	-	-	-	.92	-.58	-.32	-.21	-1.44	-.23	-.18	-	-	-
	WIND	-	-	-	2325	2427	1720	1067	1253	1151	1746	1331	1576	-
Minidoka Dam	EVAP	-	-	-	B7.71	9.21	11.25	13.77	10.24	9.24	4.20	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	5105	3915	4985	3870	4825	3920	3790	3420	3600	4165	4160	5395	51150
Moscow Univ. of Idaho	EVAP	-	-	-	4.92	5.39	6.35	9.10	7.87	5.03	-	-	-	-
	DEP	-	-	-	1.84	1.19	1.12	1.36	1.76	1.60	-	-	-	-
	WIND	-	-	-	1858	2095	1313	1043	1011	1168	-	-	-	-
Palisades Dam	EVAP	-	-	-	-	-	5.99	8.01	5.66	B4.79	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
ILLINOIS														
Carbondale Sewage Plant	EVAP	-	-	-	3.47	B6.61	B5.37	B5.71	4.97	B4.18	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	1710	1120	733	B537	329	562	-	-	-	-
Rockford 4NE	EVAP	-	-	-	-	4.43	3.59	B4.00	3.16	3.11	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	2122	1338	1206	1024	1629	-	-	-	-
Springfield WB Airport	EVAP	-	-	-	4.42	8.41	B6.38	7.53	7.34	5.81	4.47	-	-	-
	DEP	-	-	-	-.77	2.51	-.60	-.86	.12	.14	.75	-	-	-
	WIND	-	-	-	3449	3151	2252	2244	2108	2794	3297	-	-	-
Urbana Engr. Campus	EVAP	-	-	-	-	4.67	4.32	5.49	B4.97	3.58	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	538	109	524	529	615	-	-	-	-
INDIANA														
Evansville WB Airport	EVAP	-	-	-	-	8.10	5.98	7.40	7.72	6.15	4.27	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	2483	1994	1752	1671	1937	1670	-	-	-
Kendallville	EVAP	-	-	-	3.18	B5.75	5.45	B5.76	B5.12	3.88	2.81	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	1678	-	-	801	683	956	1075	-	-	-
Oaklandon Geist Res.	EVAP	-	-	-	2.93	5.19	B4.92	5.72	B5.18	4.12	3.16	-	-	-
	DEP	-	-	-	-.99	.27	-.78	-.98	-.76	-.15	.86	-	-	-
	WIND	-	-	-	2350	1212	743	730	643	833	1104	-	-	-
Valparaiso Wtr. Wks.	EVAP	-	-	-	-	5.17	4.16	B4.56	4.89	3.65	2.41	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	1434	541	409	438	980	1037	-	-	-
IOWA														
Ames 3SW	EVAP	-	-	-	2.75	6.32	B4.91	6.72	6.59	4.29	3.06	-	-	-
	DEP	-	-	-	-2.15	-.25	-2.89	-2.53	-.96	-1.30	-.56	-	-	-
	WIND	-	-	-	2635	1986	1264	1455	1520	1940	2022	-	-	-
Cherokee	EVAP	-	-	-	2.38	B5.74	4.99	6.56	5.78	3.36	2.55	-	-	-
	DEP	-	-	-	-2.11	-.43	-1.88	-1.63	-1.11	-1.84	-.90	-	-	-
	WIND	-	-	-	3380	2206	848	1317	1104	1504	1852	-	-	-

See reference notes at end of table.

Table 7--Continued

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
IOWA (Cont'd.)														
Iowa City 1S	EVAP	-	-	-	3.29	6.10	4.84	B6.21	6.08	4.05	2.53	-	-	-
	DEP	-	-	-	-1.63	.39	-1.70	-1.59	-.23	-.97	-.79	-	-	-
	WIND	-	-	-	3046	2183	1561	1429	1414	1878	1931	-	-	-
Norwich 2E SCS Farm	EVAP	-	-	-	-	B6.79	B7.02	7.86	B7.68	4.95	3.71	-	-	-
	DEP	-	-	-	-	.11	-.99	-1.28	-.15	-1.44	-.74	-	-	-
	WIND	-	-	-	-	2677	1385	1641	1388	2073	2420	-	-	-
KANSAS														
Cedar Bluff Dam	EVAP	-	-	-	B7.19	B8.84	B9.58	-	B8.55	B6.48	B4.74	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	B5335	4193	2550	-	2056	B2462	B4421	-	-	-
Fall River Dam	EVAP	-	-	4.79	B6.75	8.42	-	B10.01	8.63	B6.23	4.76	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	4847	5003	3220	-	2620	2747	2436	3070	-	-	-
Hays 1S	EVAP	-	-	-	B7.67	B9.32	B9.56	9.75	11.41	7.99	-	-	-	-
	DEP	-	-	-	-.32	-.31	-2.48	-5.33	-2.06	-3.14	-	-	-	-
	WIND	-	-	-	B5841	4566	3716	3234	3510	4041	-	-	-	-
Kanapolis Dam	EVAP	-	-	-	B7.03	B8.43	B7.84	B8.58	9.23	B5.69	B4.81	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	6087	3846	B2879	2917	3401	4183	4839	-	-	-
Manhattan Agri. Farm	EVAP	-	-	-	-	B7.42	B6.90	B7.67	7.46	B4.50	3.33	-	-	-
	DEP	-	-	-	-	-.03	-2.04	-2.75	-1.65	-2.97	-1.19	-	-	-
	WIND	-	-	-	-	1964	1540	1419	1481	1485	1699	-	-	-
Tribune 1W	EVAP	-	-	-	6.50	B9.11	B8.41	10.42	11.74	7.27	-	-	-	-
	DEP	-	-	-	-.54	-.02	-2.64	-2.43	-.36	-1.29	-	-	-	-
	WIND	-	-	-	5293	4715	4112	3397	3404	3453	-	-	-	-
KENTUCKY														
Burgin Dix Dam	EVAP	-	-	-	3.31	6.09	5.00	5.51	B5.39	4.10	2.37	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	869	-	127	110	122	127	-	-	-	-
Wolf Creek Dam	EVAP	-	-	B2.91	5.10	5.86	6.24	6.22	B5.46	4.22	2.52	B2.63	B4.84	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	897	1421	1335	645	459	422	358	405	358	1064	1263	-
LOUISIANA														
Catfish Point	EVAP	-	-	-	-	-	B5.83	B5.12	5.87	B4.00	3.48	B2.64	1.57	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	B3308	1987	1833	1894	1997	3062	3734	-
Hackberry	EVAP	B3.12	B3.17	4.88	5.79	8.42	B12.08	-	-	-	5.65	B3.84	B1.97	-
	DEP	-.41	-.47	.10	-.53	.33	4.26	-	-	-	-.33	.06	-.92	-
	WIND	4931	5023	5960	5305	4740	4570	-	-	-	3500	4675	5335	-
MARYLAND														
Beltsville	EVAP	-	-	-	-	4.46	B5.94	B7.77	6.48	4.97	3.54	-	-	-
	DEP	-	-	-	-	-1.70	-.52	+.63	+.29	+.23	+.25	-	-	-
	WIND	-	-	-	-	988	864	1059	-	1227	1210	-	-	-
Salisbury U.S.G.S.	EVAP	-	-	4.07	5.36	6.86	6.43	B7.49	6.55	4.90	3.03	-	B.93	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	2745	2229	1931	1440	1351	1194	1056	1872	-	-	-
Savage River Dam	EVAP	-	-	-	-	-	B5.38	B5.76	B5.78	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	B1067	B781	685	B776	B1095	-	-	-
MICHIGAN														
East Lansing Exp. Farm	EVAP	-	-	2.41	3.25	6.13	5.25	7.09	5.76	4.79	2.95	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	2552	1351	1982	1724	2547	2567	-	-	-
Germfask Wildlife Refuge	EVAP	-	-	-	-	B4.93	4.52	B5.75	B3.78	3.01	-	-	-	-
	DEP	-	-	-	-	.31	-1.28	-.88	-1.41	-.04	-	-	-	-
	WIND	-	-	-	-	3875	1682	B1506	1323	1968	-	-	-	-
Lupton 1SW	EVAP	-	-	-	-	B5.12	5.14	B5.47	4.47	B3.25	B1.85	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	B1070	768	723	574	791	1022	-	-	-
MISSISSIPPI														
Sardis Dam	EVAP	-	-	-	B5.16	B6.36	6.45	B8.03	8.84	5.79	4.21	B1.90	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	1365	-	1907	1004	-	-	910	1329	1141	1708	-	-
State College	EVAP	-	-	-	6.26	B8.47	B7.47	7.50	8.89	6.68	4.82	B2.63	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	3016	-	3166	2819	1742	1095	599	823	1350	1325	2278	3092	-
MISSOURI														
Columbia 9NW U. of Mo.	EVAP	-	-	-	3.69	6.59	B4.82	B6.01	B5.35	B3.90	2.75	-	-	-
	DEP	-	-	-	-.73	1.44	-1.71	-1.69	-1.19	-.87	-.34	-	-	-
	WIND	-	-	-	2620	1763	1148	1141	1075	1321	1615	-	-	-
	MAX	-	-	-	-	83.2	87.1	-	94.5	80.4	68.7	-	-	-
	MIN	-	-	-	-	54.8	64.0	-	68.5	57.9	49.6	-	-	-
Lakeside	EVAP	-	-	-	-	-	-	B5.55	5.53	4.25	3.24	-	-	-
	DEP	-	-	-	-	-	-	-3.16	-2.00	-1.30	-.69	-	-	-
	WIND	-	-	-	-	-	-	726	471	602	1362	-	-	-
St. Louis Washington U.	EVAP	-	-	-	B3.81	6.59	B5.07	5.55	5.03	3.87	2.26	-	-	-
	DEP	-	-	-	-.29	1.66	-.75	-1.29	-.80	-.64	-.65	-	-	-
	WIND	-	-	-	B1734	1184	652	663	582	698	869	-	-	-
MONTANA														
Alzada 7NW	EVAP	-	-	-	B5.10	8.34	B7.73	10.09	10.08	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	3737	3645	3305	3014	3647	-	-	-	-	-
Babb 6NE	EVAP	-	-	-	-	-	B4.57	B6.70	B5.41	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	B1361	B1047	783	716	B840	-	-	-	-
Bozeman Agri. College	EVAP	-	-	-	B4.13	7.29	6.08	9.07	6.72	3.86	B1.90	-	-	-
	DEP	-	-	-	.75	1.79	.15	1.19	-.59	-.65	-.64	-	-	-
	WIND	-	-	-	-	B1940	980	1220	1190	1200	710	-	-	-
Dillon WMCE	EVAP	-	-	-	-	-	-	B7.77	-	2.96	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	B681	600	101	-	-	-	-
Fort Assiniboine	EVAP	-	-	-	B5.67	9.93	6.77	11.36	9.27	4.78	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	5883	4448	4660	4114	5864	4104	3609	3802	3728	4155	4462	5628	54457

See reference notes at end of table.

Table 7 --Continued

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
MONTANA (Cont'd.)														
Fort Peck	EVAP	-	-	-	-	-	6.95	9.99	7.48	B4.24	-	-	-	-
	DEP	-	-	-	-	-	-.83	-.34	-1.61	-1.59	-	-	-	-
	WIND	-	-	-	-	-	3260	2783	2955	B3278	-	-	-	-
Hungry Horse Dam	EVAP	-	-	-	-	B5.07	4.88	B7.36	5.89	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Lonesome Lake	EVAP	-	-	-	-	8.80	B6.70	B10.19	B7.84	4.34	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	EVAP	-	-	-	-	5.89	4.39	6.77	5.17	2.60	B1.40	-	-	-
	DEP	-	-	-	-	-1.40	-2.56	-2.27	-2.46	-2.11	-1.54	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Sherburne Lake	EVAP	-	-	-	-	-	B5.60	7.14	5.28	-	-	-	-	-
	DEP	-	-	-	-	-	-.29	-1.20	-1.90	-	-	-	-	-
	WIND	-	-	-	-	-	2242	1647	1272	-	-	-	-	-
Terry	EVAP	-	-	-	-	B9.88	B7.64	10.69	9.90	3.69	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	6713	-	2329	2305	2224	-	-	-	-
Tiber Lake	EVAP	-	-	-	4.78	9.02	B7.86	11.60	B9.02	4.56	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Valier	EVAP	-	-	-	-	-	B5.80	B7.85	B6.38	B4.30	-	-	-	-
	DEP	-	-	-	-	-	-.87	-.64	-1.71	-1.68	-	-	-	-
	WIND	-	-	-	-	-	2625	1675	1935	2405	-	-	-	-
NEBRASKA														
Box Butte Exp. Farm (c)	EVAP	-	-	-	-	B7.61	B5.40	B7.62	7.84	B5.78	B3.60	-	-	-
	DEP	-	-	-	-	.61	-2.39	-2.20	-1.60	-.85	-	-	-	-
	WIND	-	-	-	-	B6593	B5725	4754	5302	5287	B5275	-	-	-
Bridgeport	EVAP	-	-	-	4.68	B6.77	6.18	7.48	6.97	B5.13	B3.03	-	-	-
	DEP	-	-	-	-.32	.32	-1.31	-1.45	-.90	-.34	-.35	-	-	-
	WIND	-	-	-	2739	B3108	1585	1050	1030	1283	B1290	-	-	-
Enders Dam	EVAP	-	-	-	-	-	-	-	-	B6.71	B3.94	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	B2574	2036	-	-	-
Harlan County Dam	EVAP	-	-	-	-	-	B7.70	-	B9.16	B4.89	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	B4949	-	-	-	-	-	-	-
Indianola 2N	EVAP	-	-	-	6.33	9.34	7.55	7.79	B8.67	B5.57	B3.92	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	4295	3337	2608	2168	2225	2435	2381	-	-	-
Kingsley Dam	EVAP	-	-	-	4.60	6.01	B5.70	B7.12	6.02	4.43	-	-	-	-
	DEP	-	-	-	-	-1.62	-3.13	-3.90	-3.99	-2.68	-	-	-	-
	WIND	-	-	-	2690	2355	1881	1704	1691	1617	-	-	-	-
Lincoln Agri. Farm	EVAP	-	-	-	3.75	B6.16	B5.11	6.32	6.73	3.35	-	-	-	-
	DEP	-	-	-	-1.98	-.84	-3.47	-4.22	-2.05	-3.59	-	-	-	-
	WIND	-	-	-	2462	1154	396	525	493	344	-	-	-	-
Medicine Creek Dam	EVAP	-	-	-	-	-	-	-	-	-	B4.51	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	B2424	-	-	-
Mitchell 5E (d)	EVAP	-	-	-	3.88	5.19	B4.47	6.12	5.55	4.16	-	-	-	-
	DEP	-	-	-	-.79	-.84	-2.37	-1.91	-1.52	-.94	-	-	-	-
	WIND	-	-	-	3810	3876	2757	-	-	2333	-	-	-	-
North Platte Exp. Farm (e)	EVAP	-	-	-	4.78	5.44	B5.82	5.65	5.69	4.48	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	7047	4680	3320	3640	3584	4220	-	-	-	-
Rosemont 2S	EVAP	-	-	-	7.06	8.66	B6.73	B8.45	B8.52	5.96	4.58	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	7491	5078	3156	3108	2988	3495	4288	-	-	-
Valentine Lakes Game Res.	EVAP	-	-	-	-	B6.10	-	-	-	B4.90	B4.12	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	3000	-	-	-	2340	2340	-	-	-
NEVADA														
Boulder City	EVAP	3.43	4.19	8.21	9.59	13.38	15.42	16.22	12.46	11.32	7.38	4.12	B3.26	108.98
	DEP	-.14	-.09	.63	-2.10	-1.74	-2.00	-1.01	-2.78	-.73	-.59	-.75	-.04	-11.34
	WIND	2923	2532	3911	3114	2968	2458	2178	2052	1755	2302	1953	3086	31232
	MAX	53.0	55.1	62.9	75.7	81.8	88.9	93.0	90.6	88.4	71.8	58.5	52.0	72.6
	MIN	36.7	37.5	38.7	49.1	54.1	58.0	65.1	65.2	61.7	50.0	40.1	33.4	49.1
Fallon Exp. Sta. (e)	EVAP	1.16	1.44	3.74	5.02	6.41	6.71	7.66	7.05	4.79	B3.42	1.71	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2071	1552	2691	2155	2383	1469	1270	1327	808	1362	1399	2099	20586
Ruby Lake	EVAP	-	-	-	-	-	-	11.01	-	8.73	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2520	1563	2427	1870	1890	1170	1240	-	1150	1294	1100	1860	-
Rye Patch Dam	EVAP	-	-	-	-	B9.41	13.69	14.87	12.44	10.50	4.19	-	-	-
	DEP	-	-	-	-	.04	3.17	-.35	-.94	1.19	-.82	-	-	-
	WIND	-	-	-	-	B2972	3454	2486	2235	2315	2203	-	-	-
NEW HAMPSHIRE														
Massabesic Lake	EVAP	-	-	-	-	4.64	4.79	4.99	B4.01	3.12	B1.66	-	-	-
	DEP	-	-	-	-	+.35	-.54	-1.32	-1.07	-.56	-.79	-	-	-
	WIND	-	-	-	-	1206	1393	769	671	733	962	916	-	-
West Alton	EVAP	-	-	-	-	B4.05	2.83	B5.35	B3.33	B1.67	B.93	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	1424	964	805	1023	-	-	-	-
NEW JERSEY														
Pleasantville	EVAP	-	-	-	-	-	5.42	5.82	5.67	-	B2.21	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	1118	1088	823	-	1059	-	-	-
NEW MEXICO														
Agricultural College	EVAP	3.68	3.94	7.48	9.77	13.01	15.48	14.30	10.44	9.19	6.90	3.49	2.77	100.45
	DEP	.70	-.50	-.14	-.11	1.14	2.61	2.43	.20	.99	.74	-.38	.11	7.79
	WIND	1533	1345	1971	2248	1915	1725	1613	1355	1227	1230	1189	1685	19036

See reference notes at end of table.

Table 7 --Continued

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
NEW MEXICO (Cont'd.)														
Alamogordo Dam	EVAP	B4.86	B5.40	8.40	10.83	12.45	15.55	15.21	12.94	12.23	8.73	4.54	4.44	115.58
	DEP	1.84	.96	.36	.43	-.25	1.38	1.72	1.05	2.27	1.71	.04	1.00	12.31
	WIND	2772	2532	3520	3720	2895	3152	1997	1782	2179	2380	2412	3696	33037
Bitter Lakes WL	EVAP	-	-	6.80	B10.13	11.45	13.08	13.56	11.21	9.31	6.50	2.88	3.29	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	1954	2452	2958	2808	2526	2323	1751	1482	1332	941	1464	-
Bosque Del Apache	EVAP	B3.53	B5.02	10.05	11.12	B13.53	16.38	13.95	10.82	9.44	7.47	3.88	2.81	108.00
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1340	1305	2325	2670	2200	1660	1105	775	520	985	1095	1530	17510
Caballo Dam	EVAP	B4.55	5.01	9.51	11.99	16.20	19.06	16.57	13.60	11.84	9.69	4.57	-	-
	DEP	1.36	-.34	.65	-.45	.56	2.10	2.67	1.44	1.50	2.37	-.40	-	-
	WIND	2835	2856	4157	4110	4028	3634	3066	3024	2353	3107	2690	3360	39220
Clovis 13N	EVAP	-	-	-	B11.69	11.31	13.35	14.63	12.86	11.50	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	4192	3914	3136	2494	2250	-	-	-	-
Conchas Dam	EVAP	-	-	-	8.78	10.88	B13.85	13.87	12.11	11.64	B7.81	-	-	-
	DEP	-	-	-	-1.03	-.67	.43	1.02	.31	1.99	.86	-	-	-
	WIND	5076	4324	6022	3607	3008	3233	2722	2765	2861	2479	2225	3791	42113
Eagle Nest	EVAP	-	-	-	-	-	-	9.32	-	7.46	-	-	-	-
	DEP	-	-	-	-	-	-	1.80	-	2.09	-	-	-	-
	WIND	2412	1842	2583	2388	2062	2174	1379	1391	1857	2265	-	B2756	-
Elephant Butte	EVAP	4.94	5.09	9.15	12.22	17.15	20.29	18.29	14.55	12.89	9.67	4.86	4.46	133.56
	DEP	1.96	.48	1.08	1.19	3.27	5.09	5.27	3.77	3.59	2.23	.37	1.43	29.73
	WIND	2953	2529	3469	3419	3433	3186	2889	2649	2326	2695	2248	2933	34729
El Vado Dam	EVAP	-	-	-	-	-	B11.18	10.86	-	-	-	-	-	-
	DEP	-	-	-	-	-	1.10	1.51	-	-	-	-	-	-
	WIND	-	-	-	974	970	1078	1048	-	703	707	529	-	-
Farmington 2	EVAP	-	-	B5.19	6.24	8.44	9.69	9.50	6.61	5.95	3.92	-	-	-
	DEP	-	-	1.44	.32	1.23	2.06	2.14	.61	1.11	.30	-	-	-
	WIND	1797	2002	1942	1868	1715	1076	787	449	405	631	728	1164	14564
Florida	EVAP	B4.23	B4.12	B9.22	B10.52	13.33	B14.57	11.31	10.88	10.05	7.75	-	-	-
	DEP	-	-.22	2.48	1.07	.89	.51	-.93	1.36	1.72	1.62	-	-	-
	WIND	1896	1524	2698	2748	2465	2139	1623	1421	1285	1823	1656	-	-
Jornada Exp. Range	EVAP	2.60	B3.25	6.65	9.00	12.23	13.54	12.73	10.35	8.91	6.79	2.97	2.39	91.41
	DEP	.08	-.94	-.63	-1.22	-.83	-.89	.04	-.33	.35	.68	-.70	.07	-4.32
	WIND	681	692	1343	1365	1185	1040	624	601	474	838	709	1347	10899
Lake Avalon	EVAP	-	-	-	-	-	-	-	-	-	-	-	B6.21	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	B3517	-
Narrows	EVAP	3.69	4.03	7.70	10.82	13.84	15.76	15.79	11.57	10.40	8.15	4.04	2.89	108.68
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1517	1758	2576	2735	2648	2281	1687	1476	1293	1616	1513	1836	22936
Portales 7WNW	EVAP	-	7.19	7.23	10.01	10.83	12.50	B13.68	11.87	B10.80	7.99	B3.17	-	-
	DEP	-	-	-.15	.92	.14	-.07	1.54	.32	2.44	1.84	-1.19	-	-
	WIND	3195	3102	3667	3735	3206	2529	2371	2174	2287	2364	B2069	B3903	34602
Santa Fe	EVAP	-	-	-	-	B9.91	B12.17	10.66	B8.63	B9.68	B5.74	B2.58	-	-
	DEP	-	-	-	-	1.26	1.87	1.74	.97	3.29	1.18	.14	-	-
	WIND	-	-	-	-	-	-	-	-	B2368	2578	B2265	-	-
Santa Rita (f)	EVAP	-	3.19	6.40	-	11.72	14.06	B12.20	10.02	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Tucumcari 3NE (e)	EVAP	-	-	-	B7.81	B9.05	10.74	12.04	10.95	9.63	-	-	-	-
	DEP	-	-	-	.10	-.24	.04	1.15	1.36	2.20	-	-	-	-
	WIND	3328	2967	3930	4097	4056	3829	3428	3520	3349	3322	2749	B4230	42805
NEW YORK														
Alcove Dam	EVAP	-	-	-	-	B4.34	4.52	B5.92	3.87	3.30	B1.86	-	-	-
	DEP	-	-	-	-	-.15	-.31	+.01	-.78	-.27	-.23	-	-	-
	WIND	-	-	-	-	-	680	640	548	663	823	-	-	-
Boonville	EVAP	-	-	-	-	5.59	4.91	6.42	4.47	B3.90	2.47	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	2367	1605	1876	1206	2063	2669	-	-	-
Ithaca Cornell Univ.	EVAP	-	-	-	-	B4.39	4.70	B5.33	4.35	3.57	2.32	-	-	-
	DEP	-	-	-	-	+.10	-.46	-.54	-.59	+.22	+.18	-	-	-
	WIND	-	-	-	-	2359	2332	1887	1753	2778	3264	-	-	-
New York Central Park	EVAP	-	-	-	4.29	6.08	6.03	6.72	5.84	4.18	2.60	B1.50	-	-
	DEP	-	-	-	-	+1.04	+.30	-.16	+.11	-	-.54	-	-	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
NORTH CAROLINA														
Beetree Dam (g)	EVAP	.87	1.43	2.83	3.75	5.44	-	5.33	5.46	4.47	2.90	1.09	.86	-
	DEP	-.23	-.02	+.08	-.49	-.10	-	+.03	+.48	+.53	-.17	-.92	-.29	-
	WIND	846	877	1156	956	784	-	266	270	325	622	807	1059	-
Chapel Hill 2W	EVAP	-	-	B3.50	5.37	-	B6.35	B6.87	B6.58	B5.16	3.57	-	-	-
	DEP	-	-	+.42	+1.32	-	+.80	+1.38	+1.72	+1.23	+.97	-	-	-
	WIND	-	-	1384	1438	625	745	665	690	690	925	965	-	-
Coweeta Exp. Sta. (h)	EVAP	B1.03	B1.67	2.42	3.55	4.49	B4.00	4.63	4.12	3.10	2.40	1.74	B1.22	34.37
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	781	689	940	916	718	351	302	273	363	516	751	752	7352
Lake Michie (i)	EVAP	2.13	-	2.52	-	B5.58	5.54	6.72	6.04	5.28	4.80	3.40	B2.49	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1405	-	-	-	-	-	-	-	-	-	-	-	-
Maysville 6SW	EVAP	1.99	B2.53	3.91	5.74	7.02	7.43	7.80	5.97	4.80	3.26	B2.30	B2.03	54.78
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1488	1570	1865	1820	1510	1362	1163	924	760	1369	1141	1308	16280
Murphy	EVAP	1.26	1.32	2.41	3.45	5.36	-	6.17	5.74	3.94	3.10	1.54	1.31	-
	DEP	+.23	-.17	-.59	-.87	-.18	-	+.43	+.67	-.16	+.21	-.10	+.4	-
	WIND	318	326	403	383	306	-	175	108	125	360	515	522	-
NORTH DAKOTA														
Bowbells 5E	EVAP	-	-	-		-	5.63	9.44	5.75	B3.56	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	2519	3059	2418	2907	2554	-	-	-

See reference notes at end of table.

Table 7 --Continued

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
NORTH DAKOTA (Cont'd.)														
Devils Lake WBC	EVAP	-	-	-	B1.52	7.24	4.95	8.10	B5.24	B2.99	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	1936	1890	1310	1358	1224	1436	-	-	-	-
Dickinson Exp. Sta. (e)	EVAP	-	-	-	-	B6.63	B4.86	6.89	B6.92	3.41	-	-	-	-
	DEP	-	-	-	-	1.02	-1.23	-1.08	-.33	-1.57	-	-	-	-
	WIND	-	-	-	-	3625	3455	3460	3460	2320	-	-	-	-
Edgeley Exp. Farm	EVAP	-	-	-	B3.44	B6.52	B5.22	B7.34	B5.65	B3.28	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	B4062	B2532	-	-	-	B1988	-	-	-	-
Mandan Exp. Sta. (e)	EVAP	-	-	-	-	5.64	4.47	6.19	4.77	2.87	-	-	-	-
	DEP	-	-	-	-	.30	-1.46	-1.14	-1.80	-1.64	-	-	-	-
	WIND	-	-	-	-	3735	3384	2933	3038	3290	-	-	-	-
Riverdale	EVAP	-	-	-	B4.32	8.65	B7.33	9.29	B7.20	B4.27	B2.41	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	B4273	4359	3353	3058	3029	B2888	3335	-	-	-
OHIO														
Charles Mill Dam	EVAP	-	-	-	B3.62	5.22	5.73	B6.48	5.95	4.29	2.78	-	-	-
	DEP	-	-	-	-.09	+.32	-.31	-.15	-.12	-.22	-.06	-	-	-
	WIND	-	-	-	-	2138	1609	1522	1385	1729	1748	-	-	-
Columbus Ohio State U.	EVAP	-	-	-	B2.68	4.03	-	4.37	4.39	B3.33	2.13	-	-	-
	DEP	-	-	-	-.64	-.42	-	-.34	-.41	-.19	+.03	-	-	-
	WIND	-	-	-	-	566	399	406	302	482	379	-	-	-
Dayton	EVAP	-	-	-	B3.54	5.55	6.06	6.11	5.76	4.08	B2.60	-	-	-
	DEP	-	-	-	-.36	+.18	-.36	-.71	-.19	-.26	+.13	-	-	-
	WIND	-	-	-	-	1987	1839	1657	1613	1675	1499	-	-	-
Senecaville Dam	EVAP	-	-	-	3.48	6.32	5.82	6.53	5.65	B4.64	B3.10	-	-	-
	DEP	-	-	-	-.78	+.83	-.43	-.02	-.19	+.06	+.24	-	-	-
	WIND	-	-	-	2830	2085	1476	1312	1242	1544	1705	-	-	-
Wooster Exp. Farm	EVAP	-	-	-	-	B5.83	6.04	B6.63	6.46	4.96	2.96	-	-	-
	DEP	-	-	-	-	+.36	+.61	+.43	+.10	+1.18	+.82	-	-	-
	WIND	-	-	-	-	-	3101	2831	2624	3344	3533	-	-	-
OKLAHOMA														
Altus Dam	EVAP	B3.55	B3.49	6.65	8.35	B9.85	10.26	11.93	12.04	8.86	6.44	B3.35	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	3235	2781	3494	3022	2407	1971	1718	1871	1907	2012	2048	-	-
Canton Dam	EVAP	B3.61	-	-	-	-	9.23	11.88	13.07	B8.54	6.69	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	4474	-	-	-	-	2828	3168	2935	3227	3328	-	-	-
Fort Gibson Dam	EVAP	-	-	B4.28	5.52	7.13	6.87	B7.65	8.52	6.58	B4.91	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	2082	2154	1483	1403	1051	1122	1266	1556	-	-	-
Fort Supply Dam	EVAP	-	-	-	B8.45	B9.43	B9.02	B10.61	11.66	7.94	B5.65	-	-	-
	DEP	-	-	-	-	-.09	-2.13	-1.08	.54	-.96	-.31	-	-	-
	WIND	-	-	-	6345	5264	3684	3551	4179	3850	3270	-	-	-
Goodwell	EVAP	-	-	-	B7.00	B11.63	B9.58	B12.70	B11.21	9.61	B7.07	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	B5275	5520	3922	2955	3750	4140	3383	-	-	-
Grand River Dam	EVAP	B3.45	-	5.13	5.85	8.70	B8.57	9.44	10.51	B6.58	B4.85	B3.23	-	-
	DEP	-	-	.70	-.49	1.49	.18	-.11	1.53	-.20	.61	.48	-	-
	WIND	4099	-	3839	3608	2281	2250	1759	1825	1975	2298	3130	-	-
Great Salt Plains	EVAP	-	-	4.79	B6.20	B7.46	8.03	10.03	10.29	6.98	5.29	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	4656	4291	3198	2766	2767	2633	2990	3060	-	-	-
Heyburn Dam 4E	EVAP	-	-	B4.71	B6.70	B7.45	-	-	B7.53	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	2576	2531	1327	-	-	B722	-	-	-	-	-
Hulah Dam	EVAP	B2.37	-	5.18	B5.80	-	B7.93	B7.95	B9.20	B6.66	B4.89	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2973	-	3802	4097	-	1750	1410	1655	B1786	2240	-	-	-
Norman University	EVAP	-	-	-	6.48	B7.02	B7.38	8.42	B10.46	6.93	4.54	-	-	-
	DEP	-	-	-	1.04	.42	-.16	-.49	2.07	.23	-.12	-	-	-
	WIND	-	-	-	2250	B1718	1580	1261	1083	1134	1526	-	-	-
Stillwater	EVAP	-	-	-	B6.05	B6.59	7.66	8.98	B11.03	B7.97	B6.47	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	5101	3328	2666	2023	2104	2158	2099	-	-	-
Tenkiller Ferry Dam	EVAP	B2.26	-	4.01	5.56	6.93	B6.30	7.21	8.30	B6.34	B3.84	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1607	-	1289	1307	584	396	295	448	678	631	-	-	-
Tipton	EVAP	-	-	7.20	9.89	B10.65	11.31	B13.08	11.03	B9.36	6.94	-	-	-
	DEP	-	-	1.51	2.50	1.05	.05	.48	-.81	-.10	.80	-	-	-
	WIND	-	-	-	-	-	-	-	1945	2470	-	-	-	-
Wister Dam	EVAP	B2.37	-	B4.97	B6.18	B7.40	B7.33	B8.33	B8.09	-	B4.23	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1971	-	2540	2398	1187	1228	939	940	-	1298	-	-	-
Woodward Field Sta. (e)	EVAP	-	-	-	B6.18	B7.08	7.84	9.92	10.29	B6.49	-	-	-	-
	DEP	-	-	-	-.24	-.27	-1.64	-.64	.46	-.91	-	-	-	-
	WIND	-	-	-	6628	5107	4526	4814	3370	-	-	-	-	-
OREGON														
Corvallis State College	EVAP	-	-	-	B4.19	-	B5.90	6.38	6.06	3.39	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	B331	314	244	-	-	-	-	-
Cottage Grove Dam	EVAP	-	-	-	-	B5.84	8.48	8.98	8.21	5.24	B1.66	-	-	-
	DEP	-	-	-	-	-	2.93	.76	1.42	.45	-	-	-	-
	WIND	-	-	-	-	B1352	1262	1287	1349	1254	1533	-	-	-
Dorena Dam	EVAP	-	-	-	-	5.62	9.24	9.38	8.48	5.31	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	2140	2378	2151	2100	1541	-	-	-	-
Fern Ridge Dam	EVAP	-	-	-	-	B5.27	B8.42	8.72	7.63	5.00	B1.39	.73	B.40	-
	DEP	-	-	-	-	-.10	2.56	.14	.37	-.16	-	-	-	-
	WIND	-	-	-	-	B1539	1472	1924	1398	1385	1367	1352	1856	-

See reference notes at end of table.

Table 7 --Continued

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
OREGON (Cont'd.)														
Hermiston 2S (e)	EVAP	-	-	-	B4.24	6.00	6.33	8.11	6.94	4.40	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	3814	1378	-	2376	3777	2148	2442	2186	1371	1989	1353	2559	-
Malheur Branch Exp. Sta.	EVAP	-	-	-	6.28	6.69	8.49	10.45	8.38	5.33	1.90	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	1472	957	701	636	420	372	389	-	-	-
Medford Exp. Sta.	EVAP	B.37	B.75	2.01	4.81	5.59	8.72	9.40	7.36	4.64	B1.54	.77	-	-
	DEP	-	-.37	-.39	.95	-.04	1.96	.58	-.07	-.08	-.43	.10	-	-
	WIND	647	388	619	467	464	443	427	338	B214	155	561	439	5162
Odell Lake-Land Pan	EVAP	-	-	-	-	B3.36	B5.33	6.36	4.07	2.27	.38	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	523	B502	448	386	640	571	-	-	-
	MAX	-	-	-	-	66.3	83.5	86.8	75.5	60.3	40.4	-	-	-
	MIN	-	-	-	-	41.4	48.1	51.9	47.9	42.4	33.7	-	-	-
Odell Lake-Water Pan (j)	EVAP	-	-	-	-	2.07	4.01	4.88	5.17	3.91	1.95	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	1175	1073	1181	919	1080	1230	-	-	-
	PAN	-	-	-	-	53.5	66.6	73.3	69.4	64.6	52.8	-	-	-
	LAKE	-	-	-	-	46.4	56.1	63.9	65.2	61.8	52.7	-	-	-
Warm Springs Res.	EVAP	-	-	-	-	7.03	8.97	11.71	9.00	6.44	B2.66	-	-	-
	DEP	-	-	-	-	-.93	-.10	-.75	-1.87	-.27	-.95	-	-	-
	WIND	2065	1634	2468	2212	2427	2328	2156	1865	1682	1651	1181	1825	23494
Wickiup Dam	EVAP	-	-	-	B5.79	B6.14	8.83	9.99	8.58	B5.43	-	-	-	-
	DEP	-	-	-	-	.37	2.33	.86	1.34	.10	-	-	-	-
	WIND	3600	2020	-	2020	2020	1840	1770	1530	B1232	1610	-	-	-
PENNSYLVANIA														
Confluence Dam 1SW	EVAP	-	-	-	2.81	5.50	B4.91	5.37	5.21	3.77	2.66	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	1823	1629	1177	1164	1271	1300	1351	-	-	-
Ford City Dam	EVAP	-	-	-	-	-	5.66	B5.79	4.90	3.99	2.41	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	1114	969	860	1160	1229	-	-	-
Hawley 1S Wallen	EVAP	-	-	-	-	4.90	4.77	5.60	4.44	3.08	1.91	-	-	-
	DEP	-	-	-	-	-.60	-1.09	-.93	-1.21	-.97	-.58	-	-	-
	WIND	-	-	-	-	2284	1683	1534	1479	1908	1860	-	-	-
Jamestown 2NW	EVAP	-	-	-	-	B4.78	5.15	6.19	4.96	B3.50	2.28	-	-	-
	DEP	-	-	-	-	+.65	+.11	+.37	+.27	+.14	-	-	-	-
	WIND	-	-	-	-	1438	1035	1002	885	1145	1370	-	-	-
Neffs Mill 4NE	EVAP	-	-	-	-	4.89	B4.21	4.97	4.70	3.52	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	1221	516	554	473	607	-	-	-	-
Pimple Hill	EVAP	-	-	-	-	B7.54	-	6.87	5.45	4.14	3.04	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	3069	2791	3270	4164	-	-	-
SOUTH CAROLINA														
Clemson College	EVAP	1.75	2.53	B3.91	B5.85	7.47	B6.66	7.06	B6.48	B4.46	B3.76	B1.88	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1401	1336	1922	1750	1240	928	758	499	315	481	856	1124	12610
Union 7SW	EVAP	1.75	2.18	3.34	B5.31	7.57	6.90	7.04	7.58	5.05	3.85	B1.76	B.98	53.31
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1538	1581	1344	2021	1693	1350	1310	1467	1068	1326	1364	1232	17294
SOUTH DAKOTA														
Angostura Dam	EVAP	-	-	-	B5.09	7.81	B6.93	9.24	9.02	B5.58	B3.12	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	B2695	B2914	B1992	1427	1704	B1611	B1523	-	-	-
Deerfield Dam	EVAP	-	-	-	-	-	5.42	8.64	8.32	5.09	B3.45	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	3331	3667	3782	3805	4045	-	-	-
Huron 4SSE	EVAP	-	-	-	B4.64	6.76	6.10	7.43	B7.65	4.64	B3.04	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	B4724	4802	2611	2561	2866	3095	3376	-	-	-
Newell 3NW (e)	EVAP	-	-	-	3.64	5.54	4.80	7.07	7.25	4.12	-	-	-	-
	DEP	-	-	-	-.39	.06	-1.65	-.75	.39	-.83	-	-	-	-
	WIND	-	-	-	5026	3527	3060	2652	3392	3752	-	-	-	-
Redfield 6E	EVAP	-	-	-	-	B7.98	B6.40	B7.51	B6.80	B3.80	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	4579	3235	2374	2222	2652	-	-	-	-
Shadehill Dam	EVAP	-	-	-	-	B9.78	B8.48	B9.99	B10.03	B5.81	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	4590	B3493	B3131	3520	B4076	-	-	-	-
TENNESSEE														
Center Hill Dam	EVAP	-	-	B2.97	B3.87	B8.40	B6.90	7.99	7.39	6.22	3.42	B2.33	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1600	-	1426	1214	-	799	808	863	1137	755	1704	2184	-
Jefferson City	EVAP	.97	1.26	2.21	3.65	5.48	5.26	5.86	5.20	4.09	2.69	1.06	.88	38.61
	DEP	-.08	-.36	-.96	-.86	-.22	-1.31	-.45	-.03	-.17	-.02	-.43	+.07	-4.82
	WIND	676	525	824	827	535	302	309	297	208	224	565	459	5751
Neptune	EVAP	-	-	2.23	3.87	6.06	5.14	B6.03	6.25	4.67	2.87	B1.62	-	-
	DEP	-	-	-2.47	-1.72	-.38	-1.63	+.09	+1.47	+1.41	+.86	+.33	-	-
	WIND	1436	993	1344	1197	883	636	595	570	512	492	1050	1221	-
Paris	EVAP	-	-	2.76	4.04	7.38	5.46	6.25	6.70	4.87	3.18	1.47	1.42	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1206	862	1243	1036	577	258	140	192	145	189	559	732	7139
TEXAS														
Austin WB Airport	EVAP	-	-	B7.77	7.66	7.45	B9.49	11.28	12.82	B9.10	6.08	B3.76	B3.23	-
	DEP	-	-	2.80	1.68	.38	1.30	2.18	3.74	2.42	.88	.56	.85	-
	WIND	-	-	3490	3030	2154	2724	2272	2405	1628	1703	2840	2879	-
Balmorhea Exp. Pan (e)	EVAP	4.20	3.66	6.19	8.73	9.28	10.96	10.28	9.84	7.85	6.36	3.88	4.33	85.56
	DEP	2.31	.86	1.23	2.49	1.51	2.82	2.31	2.16	2.51	2.40	.98	2.25	23.83
	WIND	3112	2194	2889	3369	2965	3224	2249	2184	1870	1940	1995	3017	31008
Beaumont Exp. Farm	EVAP	B.27	B.24	.44	.49	.62	.63	7.06	17.49	B5.82	4.33	2.87	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	3441	3139	2367	2276	1548	B812	1357	-	-	-	-

See reference notes at end of table.

Table 7 --Continued

TOTAL EVAPORATION AND WIND MOVEMENT

YEAR 1951

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
TEXAS (Cont'd.)														
Beeville (e)	EVAP	B4.03	B2.69	5.37	6.30	6.18	6.36	8.19	10.08	5.64	4.48	2.99	2.81	69.15
	DEP	1.51	.10	.81	1.34	-.12	-.37	.98	2.95	.35	.09	-.31	.30	11.66
	WIND	-	-	6720	6085	4713	3930	4338	5171	3844	3686	4566	5048	-
Buchanan Dam	EVAP	B4.73	-	B6.85	8.52	-	-	13.49	13.96	B9.14	B7.62	4.21	3.43	-
	DEP	-	-	1.07	.89	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	2936	2394	B2332	B2482	2598	2100	-
College Station	EVAP	B2.96	B2.87	B5.40	5.55	6.18	7.15	-	-	-	-	-		-
	DEP	1.24	.42	2.35	1.57	.99	1.11	-	-	-	-	-	-	-
	WIND	5061	4049	5140	4495	3387	3780	-	-	-	-	-	-	-
Del Rio WB Airport	EVAP	B4.82	-	7.48	9.35	9.32	10.88	14.06	13.17	9.74	6.17	3.86	3.39	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1513	-	2112	1968	2268	2293	2077	1718	1403	1014	1053	823	-
Denison Dam	EVAP	B4.27	-	6.65	8.70	8.20	9.68	11.44	12.82	8.62	7.29	3.22	3.38	-
	DEP	1.99	-	1.35	1.55	.43	.18	1.33	2.53	1.12	2.13	-.53	.96	-
	WIND	4522	-	4752	4910	3047	3156	2355	2327	2291	3136	3514	4429	-
Dilley	EVAP	B4.11	-	B6.99	8.31	B8.34	9.57	12.80	B12.46	B8.63	B6.58	3.88	3.21	-
	DEP	1.36	-	.92	.82	.08	-.26	2.08	1.94	1.00	.73	.24	.59	-
	WIND	1016	-	1454	1136	1316	1226	1192	1015	888	831	960	794	-
Fort Stockton	EVAP	B6.55	-	B8.24	11.65	11.58	B14.01	17.37	B16.14	-	-	-	-	-
	DEP	3.04	-	-	.61	-1.14	.30	4.46	4.64	-	-	-	-	-
	WIND	2694	-	-	2757	3646	2960	2568	2074	-	-	-	-	-
Iowa Park Exp. Sta. (e)	EVAP	B2.02	-	4.10	5.38	5.29	6.43	8.44	B8.35	6.13	4.31	1.89	2.02	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	3667	3650	2906	2817	2135	1888	2007	2258	2043	2827	-
Lake Kickapoo	EVAP	-	-	6.98	10.88	B11.55	B10.97	13.98	14.25	10.87	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	2689	5258	4801	3557	B2870	3686	3780	-	-	-	-
Laredo WB Airport	EVAP	B5.71	B6.53	9.23	12.48	11.76	14.61	17.00	16.05	B11.31	7.99	5.48	5.47	123.62
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2602	3211	3469	3836	3906	4851	4762	4302	3437	2626	2754	2327	42083
Mansfield Dam	EVAP	B3.91	B3.15	B6.30	B7.74	7.17	9.73	12.55	12.19	B7.39	6.37	B3.58	B3.55	83.63
	DEP	-	-	-	-	-	.40	-	2.23	.11	-	.06	-	-
	WIND	2217	2113	2587	2983	2480	3122	2462	2221	1965	2086	2369	2085	28690
Red Bluff Dam	EVAP	4.69	-	B5.49	-	-	-	-	-	-	-	-	-	-
	DEP	-.25	-	-3.11	-	-	-	-	-	-	-	-	-	-
	WIND	3366	-	-	-	-	-	-	-	-	-	-	-	-
Spur (k)	EVAP	B2.92	-	5.81	7.22	B7.68	B8.28	9.29	B9.19	6.26	B5.43	3.89	B3.47	-
	DEP	.72	-	1.10	.74	.11	-.19	1.30	1.17	.25	1.55	.58	1.46	-
	WIND	4431	-	7932	8117	7331	7112	5226	3829	4639	5458	5078	5930	-
Weslaco Exp. Sta. (e)	EVAP	3.23	3.18	4.29	5.10	5.76	B7.06	B7.91	6.71	B5.23	B4.90	3.16	2.86	59.39
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2026	2755	3084	2493	2997	4180	3661	2608	1943	1896	2643	3284	33570
William Harris Res.	EVAP	B3.44	B3.30	5.40	5.77	6.55	B7.59	7.88	B8.47	B5.23	4.61	3.13	2.39	63.76
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2451	2618	3015	2522	2112	1649	-	1166	1014	1166	1740	1970	-
Winter Haven Exp. Sta. (1)	EVAP	2.29	1.87	4.15	5.04	B6.06	B10.87	13.25	12.34	8.87	6.73	4.54	3.69	79.70
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1582	1761	1726	1499	2144	2880	3004	2453	2244	1774	1637	1194	23898
Ysleta	EVAP	B3.88	B5.55	7.62	11.01	14.37	15.70	14.93	B12.84	10.26	B8.52	4.68	3.40	112.76
	DEP	.76	.93	-.83	-.08	.97	2.00	2.50	2.20	1.73	2.33	.82	.41	13.74
	WIND	1692	-	2420	2653	2104	1789	1542	1402	1123	1606	1670	2164	-
UTAH														
Bear River Refuge	EVAP	-	-	-	-	6.89	9.29	11.14	9.96	B6.54	3.49	-	-	-
	DEP	-	-	-	-	-1.92	-.22	-.84	-.51	-.26	-	-	-	-
	WIND	1630	849	1993	2309	1900	1967	1567	2050	1265	1768	1348	2123	20769
East Portal	EVAP	-	-	-	-	B6.49	6.42	8.00	5.52	6.12	2.40	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	B2538	1869	1415	1422	1928	1996	-	-	-
Fish Lake RS	EVAP	-	-	-	-	-	-	6.78	5.32	-	B3.70	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	1342	1255	B1608	B1923	-	-	-
Fort Duchesne	EVAP	-	-	-	-	B7.48	B6.97	9.33	6.86	6.12	B3.06	-	-	-
	DEP	-	-	-	-	-.23	-.63	.70	-.20	.19	-	-	-	-
	WIND	-	-	-	1905	1851	1382	970	600	632	655	B711	-	-
Greenriver Airway	EVAP	-	-	-	-	-	B9.60	10.46	7.81	5.77	B3.39	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	1105	744	416	260	B342	-	-	-
Logan USAC Exp. Sta.	EVAP	-	-	-	B5.65	B6.56	7.28	8.61	B7.86	6.36	2.48	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	1725	1054	721	1154	1019	1030	-	-	-
Moon Lake	EVAP	-	-	-	-	-	6.06	B7.79	B5.65	-	-	-	-	-
	DEP	-	-	-	-	-	-	-.31	-1.26	-	-	-	-	-
	WIND	-	-	-	-	-	1705	1270	994	-	-	-	-	-
Piute Dam	EVAP	-	-	-	-	7.64	10.33	B9.56	8.11	8.17	4.68	-	-	-
	DEP	-	-	-	-	-1.71	-.91	-1.20	-1.27	.52	-.16	-	-	-
	WIND	-	-	-	-	2083	1831	1612	1543	1267	1479	-	-	-
Provo Airport	EVAP	-	-	B3.53	B5.46	B6.39	8.35	9.24	7.80	B6.02	2.78	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	1932	1649	1412	830	846	529	945	-	-	-
Scofield Dam	EVAP	-	-	-	-	B5.95	7.02	8.91	6.25	6.43	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	B2088	2083	1698	1186	1410	B1413	-	-	-
Utah Lake Lehi	EVAP	-	-	2.84	5.64	7.49	8.69	10.38	B8.86	7.12	3.20	1.13	-	-
	DEP	-	-	-.36	-.21	-1.25	-1.46	-.67	-.86	-.06	-.81	-.29	-	-
	WIND	2261	1937	3117	2616	2760	2183	1769	1936	1697	1771	1515	1962	25524
Vernal Airport	EVAP	-	-	-	-	-	-	B7.32	B4.99	B4.08	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	1021	934	-	2112	2133	-	1114	B751	674	-	-	-	-
VIRGINIA														
Charlottesville 1W	**EVAP**	-	-	-	-	-	-	-	6.16	4.91	3.47	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	-	-	795	856	B1002	B1350	-	-

See reference notes at end of table.

TOTAL EVAPORATION AND WIND MOVEMENT

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual
VIRGINIA (Cont'd.)														
Holland 1E	EVAP	-	-	-	B5.96	B6.67	B7.17	B6.88	-	B3.87	2.55	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	1650	1192	857	-	-	1343	-	-	-
WASHINGTON														
Bumping Lake	EVAP	-	-	-	-	-	B5.38	B7.62	6.43	3.74	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	B1238	1468	1400	964	-	-	-	-
Lake Kachess	EVAP	-	-	-	-	-	5.81	7.46	6.34	B4.10	-	-	-	-
	DEP	-	-	-	-	-	1.03	1.05	1.30	1.39	-	-	-	-
	WIND	-	-	-	-	-	1621	1692	1628	1258	-	-	-	-
Lind 3NE (m)	EVAP	-	-	-	6.83	8.95	10.35	13.68	10.60	7.18	-	-	-	-
	DEP	-	-	-	2.08	1.89	2.49	2.88	1.03	1.34	-	-	-	-
	WIND	3003	2226	3293	2476	2851	1922	2074	1430	1855	2159	2265	2367	27921
Moses Lake 2E	EVAP	-	-	-	B6.52	7.17	B8.02	11.05	B9.06	-	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	740	-	1864	-	B1345	1299	917	1007	936	-	-	-
Othello 5E	EVAP	-	-	-	B6.39	8.00	9.33	11.67	8.96	7.10	-	-	-	-
	DEP	-	-	-	.86	.45	.33	-.94	-1.64	.22	-	-	-	-
	WIND	2830	2370	-	2610	2390	2230	2180	1880	2010	2040	1640	1950	-
Prosser 4NE (m)	EVAP	-	-	2.29	4.80	B5.79	B6.44	8.02	6.75	4.46	1.92	.60	-	-
	DEP	-	-	-.19	.65	.24	-.16	.14	.05	.39	-.47	-.43	-	-
	WIND	2403	1662	2219	1980	1893	1322	1485	1154	1490	1320	1244	2016	20188
Quincy 4S	EVAP	-	-	-	B8.07	8.80	9.93	11.59	9.38	5.83	-	-	-	-
	DEP	-	-	-	2.16	.41	.03	-2.09	-2.10	-1.59	-	-	-	-
	WIND	2330	1740	-	3220	3660	2948	2475	2107	1635	1345	1395	1870	-
Rimrock Tieton Dam	EVAP	-	-	-	-	6.30	8.24	10.27	9.15	4.43	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	2937	2276	2224	2196	1399	-	-	-	-
Seattle Maple Leaf Res.	EVAP	-	B1.21	1.27	4.62	4.72	6.88	7.66	5.85	3.97	1.49	.73	B.44	-
	DEP	-	.32	-.49	1.71	.32	2.11	1.38	.88	.72	-.06	.08	-.09	-
	WIND	-	-	-	-	-	-	-	-	-	-	-	-	-
Walla Walla 3W	EVAP	-	-	-	B5.93	7.54	B7.76	9.93	8.23	5.15	2.37	-	-	-
	DEP	-	-	-	1.63	1.36	.18	-.61	-.93	-.12	-.18	-	-	-
	WIND	-	-	-	1669	2072	1114	1058	960	779	1268	-	-	-
Wind River	EVAP	-	-	-	B4.15	4.27	6.30	7.13	5.55	-	B1.62	-	-	-
	DEP	-	-	-	.95	-.59	.75	.06	-.27	-	.05	-	-	-
	WIND	-	533	899	-	790	614	509	646	-	337	-	-	-
WEST VIRGINIA														
Clarksburg	EVAP	-	-	-	B3.04	4.52	5.13	4.80	4.02	2.58	2.09	-	-	-
	DEP	-	-	-	-.70	-.37	-.47	-1.25	-.83	+1.00	+.06	-	-	-
	WIND	-	-	-	3038	1899	1389	1345	1239	1441	1468	-	-	-
Hogsett Gallipolis Dam	EVAP	-	-	-	-	5.25	B6.42	B6.45	5.76	-	3.26	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	1453	1167	1220	1089	1365	1211	-	-	-
Wardensville	EVAP	-	-	-	B4.08	B4.48	B5.46	5.62	B5.02	B5.19	3.59	-	-	-
	DEP	-	-	-	-	-.05	-.42	-.80	-.66	+.86	+.52	-	-	-
	WIND	-	-	-	-	-	619	397	245	451	593	-	-	-
WISCONSIN														
Marshfield Exp. Farm	EVAP	-	-	-	-	-	B5.39	B6.85	B4.67	3.29	B2.70	-	-	-
	DEP	-	-	-	-	-	-.28	.41	-1.45	-.97	-.14	-	-	-
	WIND	-	-	-	-	-	B1627	2081	1968	2908	B2457	-	-	-
Rainbow Reservoir	EVAP	-	-	-	-	-	B5.50	B6.18	2.83	B2.40	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	1610	1595	1614	1932	-	-	-	-
Trempealeau Dam 6	EVAP	-	-	-	-	8.14	7.51	7.67	5.94	B4.93	B4.68	-	-	-
	DEP	-	-	-	-	1.99	.62	-.08	-.89	-.05	1.10	-	-	-
	WIND	-	-	-	-	3912	2888	2812	2460	3972	3218	-	-	-
WYOMING														
Archer (e)	EVAP	-	-	-	B3.48	4.77	4.54	6.50	6.06	5.28	-	-	-	-
	DEP	-	-	-	-1.03	-.92	-2.24	-1.31	-.93	-.31	-	-	-	-
	WIND	8400	6190	-	3706	2794	1292	-	2648	2730	4494	6046	7998	-
Boysen Dam	EVAP	-	-	-	5.54	8.69	B9.29	10.97	10.30	6.35	B2.76	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2242	2320	3042	3259	2836	2835	2461	2682	2449	1904	-	-	-
Farson	EVAP	-	-	-	-	-	B10.04	B9.53	B9.25	8.98	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	-	4007	3092	2685	2548	B2293	-	-	-
Heart Mountain	EVAP		-	-	B4.41	9.20	B7.17	9.70	8.61	6.04	B3.79	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2430	2755	3325	3460	3535	B2790	2945	2570	2870	2520	2080	B2718	33998
Keyhole Dam	EVAP	-	-	-	B4.54	8.52	B6.66	9.82	9.87	4.72	B2.66	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	3567	3303	4175	3025	2586	1965	2102	2394	1945	1795	2546	3930	33333
Morton 1NW	EVAP	-	-	-		B4.67	B5.41	6.95	5.72	3.63	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND		-	-	1660	1432	656	978	1089	955	948	-	-	-
Pathfinder Dam	EVAP	-	-	-	-	5.70	6.22	8.72	8.56	5.65	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	-	-	-	-	4101	2891	2407	3342	3072	B4165	-	-	-
Sheridan Field 8NE (n)	EVAP	-	-	-	B3.42	B6.39	5.07	6.95	7.30	4.03	-	-	-	-
	DEP	-	-	-	-	-	-	-	-	-	-	-	-	-
	WIND	2826	2709	3296	3999	4073	2742	2724	2905	2768	2332	2788	3294	36456
Whalen Dam	EVAP	-	-	-	B5.73	B8.10	6.61	8.76	9.07	5.56	-	-	-	-
	DEP	-	-	-	2.00	3.08	.32	.71	1.70	.46	-	-	-	-
	WIND	-	-	-	-	3533	2596	1998	2156	2311	B2284	-	-	-

See reference notes next page.

State and Station		January	February	March	April	May	June	July	August	September	October	November	December	Annual

(a) Evaporation measured in 3-foot square sunken pan, depth of 36 inches, and filled to a depth of approximately 34 inches.

(b) Evaporation measured in 3-foot square sunken pan, depth of 18 inches, and filled to a depth of approximately 14 inches.

(c) 68-inch circular sunken pan, depth 24 1/2 inches, and filled to a depth of approximately 23 1/2 inches.

(d) B.P.I. 6-foot circular sunken pan, depth of 22 inches, and filled to approximate depth of 20 inches.

(e) B.P.I. 6-foot circular sunken pan, depth of 24 inches, and filled to approximate depth of 20 inches.

(f) Evaporation measured in 3-foot square pan, mounted on 10-foot platform.

(g) Evaporation measured in 30-inch circular pan, depth of 10 inches, and filled to depth of approximately 8 inches.

(h) 30-inch sunken circular pan, depth of 16 inches, and filled to depth of approximately 10 inches.

(i) 4-foot circular floating pan, depth of 11 inches, and filled to depth of approximately 8 inches.

(j) Pan 4 feet in diameter, depth of 36 inches, and rests on wooden raft and support in lake.

(k) Evaporation measured in sunken pan of 54-inch diameter.

(l) 10-foot sunken pan, 3 feet in depth.

(m) 4-foot circular sunken pan, depth of 24 inches, and filled to approximate depth of 22 inches.

(n) 6-foot circular sunken pan, depth of 30 inches, and filled to approximate depth of 26 inches.

Santa Fe, N. Mex.--records prior to August 1951 are from former location, Santa Fe 2SE.

MAX and MIN refer to extremes of temperatures of water in pan as recorded during the 24 hours ending at time of observation.

Odell Lake Water Pan, Oregon--temperature listed following Pan and Lake are the 5 p.m. temperatures of the water in the evaporation pan and the water in Odell Lake.

EXCESSIVE PRECIPITATION

(Excessive Short Duration Rainfall)

YEAR 1951

This table contains statistics of maximum amounts of rainfall during the calendar year 1951. Data presented in this table are generally from stations equipped with tipping bucket recording gages. Stations are at City Office locations unless otherwise shown.

Published excessive precipitation data prior to 1896 consist of maximum amounts of rainfall in 5 and 10 minute periods, also in 1 and 24 hours.

Excessive precipitation data for the years 1896-1935 inclusive, generally present the accumulated amounts of precipitation for each 5, 10, or 20-minute intervals during storms in which the rate of fall equaled or exceeded .25 inch in any 5 minute period, or .30 in any 10 minute period, or .35 in any 15 minute period, etc., the tabulation beginning with the 5 minute period where the rate of .05 inch in 5 minutes began and continuing by 10 or 20 minute intervals up to 120 minutes. A detailed explanation of the method used may be found in the publications listed in the last paragraph of this explanation.

The present method, adopted with data for the calendar year 1936, gives the maximum fall of precipitation for the periods 5 to 180 minutes, the maximum amounts being taken for the periods in which the fall is greatest for the given time, and is tabulated to show maximum amounts for 5, 10, 15, 20, 30, 45, 60, 80, 100, 120, 150 and 180 minutes, even if the fall does not equal the excessive rate for some of the periods. (The 15 minute amount was not computed for 1936-1943 and the 150 minute amount was not computed for 1944 through 1948.)

The following Table A shows limits at which precipitation was considered excessive in this publication:

TABLE A

Duration (minutes)	Depth of precipitation (inches)	Duration (minutes)	Depth of precipitation (inches)
5	.25	60	.80
10	.30	80	1.00
15	.35	100	1.20
20	.40	120	1.40
30	.50	150	1.70
45	.65	180	2.00

This table is made up from the formula, A = t + 20 where A is the accumulated depth in hundredths of inches and t is the time in minutes.

For the years 1936 through 1948 stations in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Arkansas, Louisiana, Texas, Oklahoma, and San Juan, P. R. used the limits shown in the following Table B:

TABLE B

Duration (minutes)	Depth of precipitation (inches)	Duration (minutes)	Depth of precipitation (inches)
5	.40	60	1.50
10	.50	80	1.90
15	.60	100	2.30
20	.70	120	2.70
30	.90	150	3.30
45	1.20	180	3.90

This table is made up from the formula A = 2t + 30. Its use, however, was discontinued at the end of 1948 and Table A is used by all sections for 1949 and the following years.

Publication of Data. A summary of maximum precipitation data for the years prior to 1896 is published in the annual report of the Chief of the Weather Bureau for 1895-1896. Data for the years 1896 through 1934 have been published in the appropriate annual reports of the Chief of the Weather Bureau. For the years 1935 through 1942 these data are published in the appropriate issue of the United States Meteorological Yearbook. Data for 1943 through 1949 will be presented in the final issue of the United States Meteorological Yearbook. For 1950 and each succeeding year excessive precipitation will be presented in the annual issues of the Climatological Data, National Summary.

Table 8

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1951

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
ALABAMA												
Birmingham Airport												
Jan. 14	0.31	0.40	0.40	0.40	0.43	0.43	0.46	0.51	0.51	0.51	0.51	0.52
Feb. 20	.46	.56	.61	.68	.73	.86	.87	.87	.88	.88	.88	.88
Mar. 11	.25	.41	.54	.59	.61	.64	.71	.78	.82	.82	.82	.82
Apr. 19	.27	.44	.54	.56	.58	.60	.60	.66	.71	.76	.78	.78
Apr. 21	.14	.24	.35	.43	.53	.67	.77	.88	.96	1.05	1.17	1.28
June 1	.43	.69	1.03	1.05	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.08
June 24	.32	.57	.77	1.02	1.49	1.90	2.03	2.04	2.04	2.04	2.04	2.04
June 26	.25	.41	.57	.68	.81	.93	.97	1.03	1.03	1.03	1.03	1.03
July 19	.29	.48	.57	.63	.67	.67	.67	.67	.67	.67	.67	.67
July 28	.34	.60	.74	.87	.97	1.23	1.29	1.31	1.33	1.34	1.36	1.36
Aug. 3	.34	.56	.65	.66	.67	.67	.67	.67	.67	.67	.67	.67
Aug. 7	.22	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Aug. 8	.47	.67	.69	.71	.82	.89	.90	.90	.90	.90	.90	.90
Sept. 13	.25	.49	.65	.77	.86	1.18	1.25	1.27	1.27	1.27	1.27	1.27
Sept. 22	.28	.44	.57	.75	.99	1.15	1.33	1.33	1.97	2.11	2.30	2.33
Sept. 24	.53	.86	1.21	1.45	1.56	1.58	2.16	2.81	2.86	2.83	2.93	3.01
Oct. 27-28	.21	.39	.48	.51	.64	.95	.97	.98	1.00	1.00	1.01	1.02
Oct. 31-Nov. 1	.32	.40	.53	.64	.86	.97	1.08	1.13	1.21	1.23	1.23	1.23
Dec. 20	.29	.43	.48	.50	.55	.67	.77	.85	.92	.93	1.06	1.07
Dec. 20	.18	.32	.37	.40	.40	.41	.55	.69	.72	.82	.92	1.00
Mobile												
Mar. 11	.23	.34	.56	.67	.94	1.34	1.44	1.44	1.44	1.44	1.44	1.44
Mar. 18	.16	.30	.41	.52	.69	.81	1.13	1.35	1.51	1.95	2.19	2.32
Mar. 28-29	.13	.24	.32	.37	.59	.99	1.12	1.19	1.36	1.40	1.41	1.41
Apr. 21-22	.46	.96	1.28	1.46	1.64	1.96	2.36	2.60	2.76	2.90	3.04	3.10
June 16	.25	.37	.40	.41	.41	.42	.42	.42	.42	.42	.42	.42
June 16	.31	.50	.55	.60	.63	.75	.80	1.14	1.24	1.27	1.33	1.35
June 18	.24	.33	.36	.59	.99	1.15	1.17	1.17	1.17	1.17	1.18	1.20
June 20	.30	.45	.47	.50	.50	.51	.51	.51	.51	.51	.51	.51
July 2	.10	.20	.35	.46	.85	1.22	1.39	1.51	1.62	1.74	1.77	1.78
July 8	.39	.75	1.11	1.41	1.71	1.91	1.93	1.93	1.93	1.93	1.93	1.93
July 13	.14	.27	.34	.44	.48	.50	.53	.54	.56	.56	.56	.56
July 21	.25	.34	.34	.34	.34	.34	.34	.34	.34	.34	.34	.34
July 29	.18	.33	.58	.84	1.12	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Aug. 6	.38	.63	.86	1.08	1.30	1.32	1.39	1.43	1.43	1.43	1.43	1.43
Aug. 6	.24	.43	.48	.61	.71	.79	.80	.80	.80	.80	.80	.80
Aug. 31	.12	.23	.34	.44	.54	.54	.54	.54	.54	.54	.54	.90
Sept. 6	.24	.48	.64	.68	.68	.68	.68	.68	.68	.68	.68	.68
Sept. 10	.18	.32	.36	.36	.36	.36	.36	.72	.72	.72	.79	1.02
Sept. 12	.42	.52	.77	1.09	1.60	1.80	1.83	1.83	1.83	1.83	1.84	1.90
Sept. 20	.23	.26	.34	.43	.49	.80	.85	.88	.92	.94	.95	.95
Sept. 21	.39	.68	.93	1.05	1.44	1.51	1.57	1.71	1.79	1.93	1.99	2.00
Nov. 1	.34	.61	.73	.88	.96	.99	1.01	1.02	1.03	1.03	1.03	1.06
Montgomery Airport												
Jan. 3	.24	.44	.53	.58	.72	.80	.80	.81	.81	.81	.81	.81
Jan. 14	.38	.53	.57	.58	.61	.63	.67	.68	.68	.68	.68	.69
Mar. 18	.15	.27	.38	.48	.57	.72	.86	1.00	1.09	1.20	1.30	1.40
Mar. 29	.35	.46	.50	.54	.58	.67	.72	.82	.88	.93	1.02	1.10
Apr. 19	.26	.28	.30	.32	.35	.38	.38	.38	.38	.38	.38	.39
May 20	.21	.30	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31
June 20	.32	.60	.84	.99	1.10	1.15	1.19	1.74	1.89	1.92	1.97	1.98
July 26	.22	.36	.55	.67	.84	1.23	1.39	1.46	1.51	1.51	1.59	1.59
Aug 6	.58	.97	1.32	1.64	1.89	1.93	1.93	1.93	1.93	1.93	1.93	1.93
Sept. 12	.30	.49	.65	.78	.93	1.01	1.03	1.06	1.07	1.09	1.14	1.15
Sept. 24	.52	.96	1.23	1.43	1.56	1.94	2.42	3.43	3.79	3.80	3.81	3.81
ARIZONA												
Payson												
Aug. 26	.24	.39	.47	.54	.66	.82	1.03	1.36	1.50	1.64	1.73	1.75
Oct. 30	.27	.29	.34	.35	.36	.37	.41	.43	.43	.43	.43	.43
Phoenix												
Apr. 19	.32	.61	.74	.75	.76	.76	.76	.76	.76	.76	.76	.76
July 27	.20	.34	.48	.57	.71	.77	.81	.83	.85	.85	.86	.86
Aug. 1	.18	.25	.33	.48	.61	.70	.75	.76	.77	.77	.77	.77
Tucson Airport												
Aug. 2	.22	.36	.47	.52	.60	.65	.66	.67	.67	.67	.67	.67
Winslow Airport												
July 18	.23	.38	.60	.64	.66	.70	.71	.71	.71	.71	.71	.71
Yuma Airport												
July 28	.20	.31	.47	.52	.52	.52	.52	.52	.52	.52	.52	.52
ARKANSAS												
Fort Smith Airport												
Jan. 13	.21	.34	.41	.46	.52	.57	.72	.94	1.10	1.21	1.23	1.34
Apr. 20	.24	.53	.77	.83	.90	.95	.95	1.01	1.07	1.16	1.28	1.30
June 8	.30	.49	.63	.71	.74	.79	.79	.79	.79	.79	.79	.79
June 8-9	.58	1.15	1.54	1.73	1.85	1.96	2.02	2.08	2.09	2.10	2.12	2.16
June 29	.33	.38	.39	.40	.40	.40	.40	.40	.40	.40	.40	.40
June 30	.27	.43	.51	.55	.59	.64	.67	.69	.71	.72	.80	1.04
July 1	.19	.32	.48	.53	.61	.67	.75	.83	.88	.95	1.05	1.20
July 26	.13	.31	.41	.47	.61	.67	.68	.69	.76	.80	.84	.85
Aug. 10	.35	.63	.94	1.21	1.69	1.74	1.74	1.74	1.74	1.75	1.75	1.75
Aug. 13	.36	.41	.41	.41	.41	.42	.42	.42	.42	.42	.42	.42
Aug. 21	.35	.55	.70	.73	.76	.76	.77	.78	.81	.81	.81	.87
Sept. 27	.32	.55	.80	.94	1.28	1.42	1.46	1.46	1.46	1.46	1.46	1.46
Oct. 22	.29	.36	.58	.79	.95	1.13	1.25	1.31	1.33	1.42	1.57	1.63
Oct. 27	.23	.34	.43	.64	.79	1.20	1.54	1.95	2.39	2.76	3.08	3.36
Little Rock Airport												
Apr. 6	.21	.36	.44	.56	.59	.61	.62	.64	.67	.72	.76	.83
May 1	.17	.27	.35	.36	.36	.46	.60	.65	.67	.68	.73	.92
June 19	.35	.52	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
June 30	.39	.54	.61	.63	.70	.79	.80	.81	.86	.86	.87	.99
July 18	.27	.50	.65	.90	1.10	1.22	1.24	1.24	1.24	1.24	1.24	1.24
July 24	.40	.70	.90	1.10	1.40	1.94	2.05	2.07	2.35	2.42	2.49	2.52
July 27	.25	.45	.65	.80	.85	.90	.92	.94	.95	.96	1.06	1.06
CALIFORNIA												
Blue Canyon Airport						None						
Eureka						None						
Fresno Airport												
Feb. 11	.19	.28	.42	.44	.46	.47	.49	.52	.52	.52	.52	.53
Los Angeles						None						

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
CALIFORNIA (Cont'd.)												
Red Bluff Airport												
Jan. 10	0.34	0.47	0.52	0.76	1.03	1.09	1.13	1.20	1.22	1.24	1.28	1.29
Oct. 23	.28	.39	.46	.47	.49	.53	.57	.63	.64	.66	.67	.67
Nov. 10	.21	.27	.37	.38	.44	.47	.49	.52	.55	.56	.57	.57
Sacramento												
Nov. 21	.19	.34	.40	.44	.50	.50	.54	.54	.54	.61	.61	.61
Dec. 1	.27	.36	.45	.49	.55	.63	.69	.74	.78	.87	.88	.88
San Diego Airport						None						
San Francisco												
Dec. 1	.17	.29	.37	.42	.48	.70	.76	.83	.90	.95	1.16	1.36
COLORADO												
Denver Airport												
July 5	.19	.25	.30	.40	.46	.47	.47	.48	.48	.48	.48	.48
Aug. 2	.35	.45	.57	.67	.80	.86	.98	1.00	1.02	1.03	1.03	1.04
Aug. 3	.18	.27	.51	.58	.68	.97	1.27	1.55	1.56	1.64	1.74	1.79
Aug. 31	.20	.33	.42	.46	.50	.61	.65	.65	.65	.65	.65	.65
Grand Junction Airport						None						
Pueblo Airport												
July 30	.29	.54	.77	.88	.97	1.31	1.37	1.44	1.44	1.44	1.45	1.45
Aug. 2	.18	.32	.45	.59	.76	1.10	1.25	1.42	1.43	1.46	1.49	1.49
Aug. 6	.19	.25	.36	.37	.40	.67	.69	.71	.72	.72	.72	.72
CONNECTICUT												
Bridgeport Airport												
July 19	.25	.45	.54	.54	.54	.54	.54	.61	.61	.61	.61	.61
Hartford Airport												
Feb. 7	.15	.24	.31	.39	.57	.67	.75	.80	.85	.93	1.03	1.15
Mar. 30	.18	.34	.44	.54	.91	1.01	1.12	1.31	1.44	1.53	1.65	1.79
June 4	.23	.38	.43	.50	.55	.63	.63	.65	.69	.71	.73	.77
June 17	.28	.46	.58	.65	.70	.74	.78	.80	.80	.80	.80	.80
Aug. 17		.36	.41	.42			.48	.48	.48	.48	.48	.48
Oct. 7	.25	.30	.35	.43	.54	.68	.83	1.05	1.25	1.43	1.50	1.58
Dec. 18	.22	.30	.35	.38	.44	.50	.54	.64	.73	.78	.86	.93
New Haven Airport												
Mar. 30	.27	.42	.48	.53	.67	.74	.89	1.03	1.20	1.37	1.58	1.75
July 19	.37	.68	.83	.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Oct. 7	.39	.68	.78	.88	.95	1.01	1.07	1.09	1.10	1.10	1.14	1.14
DIST. OF COLUMBIA												
Washington												
Apr. 29	.20	.33	.42	.45	.47	.49	.51	.54	.54	.55	.55	.55
May 11	.21	.41	.50	.56	.59	.62	.72	.82	.85	.86	.86	.86
June 3	.55	.87	1.08	1.20	1.31	1.39	1.44	1.45	1.46	1.48	1.48	1.49
June 13	.28	.50	.52	.53	.53	.53	.53	.53	.53	.53	.53	.53
June 30	.35	.52	.61	.63	.73	.73	.74	.76	.78	.78	79	.79
July 1	.28	.31	.32	.32	.32	.33	.33	.33	.33	.33	.33	.33
July 17	.27	.34	.34	.34	.35	.35	.35	.35	.35	.35	.35	.35
July 28	.26	.44	.53	.57	.62	.64	.71	.73	.73	.73	.73	.73
Aug. 3	.27	.43	.55	.72	.82	.82	.82	.82	.82	.82	.82	.82
Aug. 12	.27	.38	.50	.56	.68	.76	.79	.82	.83	.83	.84	.84
Sept. 2	.23	.38	.49	.59	.63	.76	.79	.84	.92	.93	.93	.95
Sept. 14	.23	.32	.34	.37	.40	.42	.45	.47	.52	.55	.60	.63
Oct. 7	.19	.31	.44	.56	.69	.75	.80	.84	.89	.93	.94	.95
FLORIDA												
Apalachicola												
Jan. 7	.30	.56	.83	.91	1.03	1.08	1.08	1.08	1.09	1.09	1.09	1.09
Mar. 19	.30	.56	.81	.87	1.02	1.46	1.59	1.65	1.67	1.67	1.68	1.68
Mar. 29	.16	.31	.37	.39	.43	.51	.54	.81	.86	.87	.93	.96
May 26	.53	.94	1.16	1.33	1.62	1.98	2.20	2.44	2.57	2.57	2.59	2.60
June 18	.30	.56	.64	.68	.96	1.12	1.43	1.46	1.52	1.60	1.73	1.80
June 20	.24	.40	.45	.49	.52	.53	.55	.55	.55	.55	.55	.55
July 1	.30	.68	.90	1.05	1.25	1.29	1.30	1.30	1.31	1.31	1.31	1.31
July 4	.24	.47	.73	.85	1.10	1.17	1.20	1.24	1.26	1.26	1.26	1.26
July 17	.24	.40	.55	.64	.67	.68	.69	.72	.72	.72	.72	.72
July 22	.32	.59	.78	1.00	1.14	1.23	1.24	1.25	1.25	1.25	1.25	1.25
July 24	.30	.35	.44	.45	.46	.48	.73	.73	.79	.80	.80	.80
July 29	.16	.30	.34	.36	.39	.42	.59	.69	.75	.79	.84	.90
Aug. 30	.23	.43	.54	.65	.66	.81	.83	.83	.83	.83	.83	.83
Sept. 9	.58	1.02	1.33	1.54	1.80	3.06	3.40	3.67	4.31	4.53	5.30	6.25
Sept. 17	.20	.34	.47	.60	.71	.83	.91	.92	.98	1.01	1.02	1.02
Sept. 27			1.33	1.47	1.50	1.59	1.63	1.69	1.69	1.69	1.71	1.71
Sept. 28	.24	.32	.37	.40	.50	.54	.56	.56	.61	.61	.61	.61
Oct. 20	.40	.67	.89	1.06	1.31	1.42	1.47	1.51	1.52	1.52	1.52	1.53
Nov. 15	.31	.45	.58	.59	.68	.69	.70	.89	.89	.94	.97	.98
Dec. 18	.34	.54	.69	.83	.93	.99	1.02	1.09	1.15	1.16	1.16	1.20
Daytona Beach Airport												
Apr. 11	.20	.35	.40	.53	.70	.70	.70	.70	.70	.70	.70	.70
Apr. 19	.30	.47	.57	.57	.64	.73	.73	.79	.79	.99	1.81	1.84
Apr. 19	.30	.33	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35
May 9	.44	.85	.89	.89	.89	.89	.89	.89	.89	.89	.89	.89
May 21	.17	.25	.36	.41	.50	.51	.51	.51	.51	.51	.51	.51
May 26	.18	.31	.34	.35	.41	.59	.66	.68	.68	.68	.68	.68
June 11	.22	.35	.36	.36	.36	.36	.36	.36	.36	.40	.47	.52
July 2	.20	.30	.35	.40	.45	.66	.81	.83	.84	.90	.93	.93
July 31	.27	.42	.53	.68	.81	.88	.90	.91	.91	.91	.91	.91
Aug. 1	.23	.35	.41	.42	.42	.42	.42	.42	.55	.55	.55	.55
Aug. 2	.29	.58	.66	.82	1.01	1.37	1.51	1.55	1.59	1.59	1.59	1.59
Sept. 3	.44	.85	1.24	1.65	2.18	2.28	2.32	2.33	2.33	2.33	2.34	2.34
Sept. 15	.49	.93	1.33	1.60	2.12	2.75	2.80	2.80	2.80	2.82	2.87	2.83
Sept. 17	.45	.80	1.12	1.40	1.53	1.56	1.77	1.77	1.79	1.79	1.85	1.85
Sept. 30	.38	.55	.79	.93	1.14	1.25	1.32	1.62	1.89	2.19	2.26	2.31
Sept. 30	.22	.34	.38	.45	.52	.57	.65	.72	.75	.77	.77	.77
Oct. 15	.25	.38	.55	.62	.80	1.00	1.20	1.32	1.47	1.57	1.60	1.60
Oct. 17	.27	.37	.38	.40	.59	.67	.76	.76	.76	.75	.77	.98
Oct. 22	.22	.40	.60	.70	.90	1.20	1.35	1.43	1.45	1.45	1.46	1.46
Nov. 15	.29	.40	.50	.53	.58	.80	.90	.95	.96	.96	1.00	1.02
Dec. 18	.20	.30	.55	.65	.77	1.15	1.35	1.45	1.50	1.60	1.67	1.75

Table 8–Continued

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1951

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
FLORIDA (Cont'd.)												
Fort Myers Airport												
July 4	0.40	0.65	1.00	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
July 6	.35	.54	.65	.67	.70	.70	.70	.70	.70	.70	.70	.70
July 7	.25	.50	.67	.72	.72	.72	.72	.72	.72	.72	.72	.72
July 9	.20	.40	.54	.57	.60	.61	.62	.62	.62	.62	.62	.62
July 11	.15	.30	.35	.50	.55	.55	.55	.62	.62	.62	.62	.63
July 14	.30	.80	1.00	1.15	1.40	1.52	1.67	1.92	2.03	2.04	2.04	2.04
July 22	.40	.75	.87	.95	1.00	1.08	1.14	1.15	1.15	1.15	1.55	1.64
July 25	.30	.40	.51	.60	.64	.75	.77	.77	.77	.80	.84	.84
July 30	.20	.37	.40	.40	.47	.58	.58	.58	.58	.58	.58	.58
Aug. 2	.15	.25	.40	.45	.50	.50	.50	.50	.50	.50	.54	.55
Aug. 7	.20	.28	.33	.40	.48	.49	.49	.49	.49	.49	.49	.49
Aug. 8	.26	.29	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Aug. 13	.44	.80	1.08	1.17	1.40	1.85	1.92	1.93	2.00	2.00	2.00	2.00
Aug. 14	.30	.47	.52	.52	.52	.52	.52	.52	.52	.52	.52	.52
Aug. 16	.25	.35	.40	.41	.41	.43	.43	.45	.45	.45	.46	.50
Aug. 20	.30	.44	.55	.60	.65	.65	.65	.65	.65	.65	.65	.65
Aug. 22	.35	.45	.53	.70	.86	.94	.97	.99	1.00	1.00	1.00	1.00
Aug. 26	.45	.55	.80	1.10	1.35	1.60	1.75	1.80	1.86	1.91	1.91	1.92
Sept. 18	.47	.70	.75	.81	1.00	1.16	1.26	1.35	1.37	1.40	1.44	1.44
Oct. 1	.20	.30	.36	.39	.44	.49	.50	.54	.55	.58	.61	.65
Oct. 1	.25	.40	.50	.65	.95	1.25	1.53	1.67	1.97	2.15	2.39	2.59
Oct. 1	.20	.31	.42	.48	.75	.90	1.05	1.06	1.17	1.31	1.41	1.60
Oct. 2	.53	.80	1.00	1.15	1.73	2.08	2.50	3.05	3.63	4.02	4.20	4.40
Jacksonville												
July 2	.55	.80	.90	1.10	1.28	1.32	1.34	1.35	1.36	1.36	1.36	1.37
July 29	.30	.45	.50	.65	.90	1.32	1.33	1.39	1.43	1.43	1.46	1.52
July 31	.25	.55	.64	.65	.65	.65	.65	.66	.66	.66	.66	.68
Aug. 2	.35	.65	.95	1.50	1.70	1.90	2.00	2.05	2.05	2.05	2.05	2.05
Sept. 2	.20	.47	.49	.49	.50	.52	.52	.53	.53	.53	.53	.53
Sept. 15	.25	.39	.54	.62	.64	.84	1.03	1.35	1.45	1.49	1.50	1.50
Sept. 30	.20	.32	.41	.50	.55	.57	.65	.75	.82	.82	.82	.86
Oct. 21	.35	.60	1.00	1.15	1.38	1.43	1.43	1.43	1.43	1.45	1.50	1.52
Oct. 21	.20	.35	.50	.55	.60	.70	.88	1.02	1.04	1.06	1.12	1.58
Oct. 21–22	.15	.25	.35	.42	.45	.60	.85	.87	.88	.89	.89	.90
Dec. 26	.20	.35	.45	.65	.85	.98	1.07	1.10	1.15	1.18	1.20	1.20
Key West												
Jan. 25	.30	.45	.46	.47	.48	.49	.53	.55	.55	.55	.55	.55
July 16	.22	.40	.44	.47	.51	.56	.56	.95	1.05	1.06	1.06	1.06
Aug. 29	.41	.50	.51	.58	.70	.71	.71	.71	.71	.71	.71	.71
Sept. 7	.25	.30	.33	.34	.35	.35	.35	.35	.35	.36	.36	.36
Sept. 9	.15	.37	.41	.46	.51	.56	.56	.56	.56	.56	.56	.56
Oct. 2	.29	.47	.53	.63	.84	.99	1.17	1.25	1.25	1.25	1.25	1.26
Nov. 5							1.80			3.03		3.09
Dec. 4							.92			.98		1.00
Miami												
Apr. 8	.33	.51	.58	.62	.66	.74	.78	.89	.91	.94	.97	1.04
Apr. 10	.23	.35	.49	.59	.81	1.01	1.05	1.06	1.34	1.59	1.65	1.67
May 13	.19	.36	.42	.44	.44	.44	.44	.44	.45	.55	.75	.75
May 17	.23	.31	.39	.41	.42	.42	.42	.42	.42	.42	.43	.43
May 19	.33	.53	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
June 6	.25	.41	.63	.71	.75	.78	.79	.80	.80	.80	.80	.80
June 15	.32	.55	.77	.83	.88	.88	.90	.90	.91	.96	.99	1.01
June 18	.29	.40	.55	.60	.64	.89	.89	.93	.93	.93	.93	.93
June 27	.31	.60	.75	.85	.91	.91	.91	.91	.91	.91	.91	.91
July 1	.23	.35	.41	.47	.50	.53	.57	.58	.59	.59	.59	.59
July 8	.13	.27	.36	.47	.52	.59	.60	.60	.61	.61	.62	.63
July 10	.22	.39	.45	.49	.56	.64	.71	.74	.78	.80	.99	1.01
July 14	.16	.32	.39	.43	.47	.55	.60	.72	.73	.73	.73	.73
July 25	.42	.74	.85	.90	.90	.90	.90	.91	.91	.91	1.05	1.05
July 29	.27	.41	.49	.59	.76	.93	.95	.95	.95	.95	.95	.95
Aug. 7	.35	.56	.72	.81	.87	.93	.97	.98	1.15	1.15	1.18	1.19
Aug. 22	.29	.43	.52	.55	.64	.69	.72	.73	.73	.73	.73	.73
Aug. 23	.22	.30	.37	.41	.49	.56	.58	.58	.58	.58	.58	.58
Aug. 30	.26	.44	.49	.50	.50	.50	.50	.50	.50	.50	.50	.51
Sept. 10	.24	.47	.70	.80	1.04	1.08	1.09	1.09	1.13	1.19	1.20	1.23
Oct. 1	.32	.55	.65	.72	.83	.88	.89	.90	.91	.93	.96	1.01
Oct. 16	.17	.31	.49	.55	.72	.98	1.18	1.29	1.57	1.61	1.62	1.76
Pensacola												
Mar. 18	.21	.38	.45	.47	.47	.56	.69	.96	1.18	1.32	1.62	1.86
Apr. 2	.22	.30	.33	.35	.39	.45	.55	.63	.67	.70	.71	.71
Apr. 16	.36	.44	.55	.62	.74	.95	1.12	1.21	1.25	1.28	1.32	1.40
May 10	.32	.44	.47	.53	.71	.78	.79	.81	.83	.83	.83	.83
May 26	.17	.26	.35	.41	.45	.60	.69	.86	.87	.91	.97	1.05
June 16	.33	.65	.93	1.14	1.33	1.38	1.38	1.39	1.41	1.42	1.87	1.95
June 18	.15	.26	.37	.42	.47	.55	.60	.64	.65	.65	.67	.70
June 21	.28	.47	.61	.74	.88	.91	.97	.99	1.01	1.03	1.11	1.15
July 16	.32	.60	.90	1.03	1.35	1.58	1.59	1.59	1.59	1.59	1.59	1.59
July 24	.24	.43	.56	.74	.77	.78	.80	.93	.97	.97	.97	.97
July 29	.25	.37	.41	.44	.47	.54	.69	.72	.72	.79	.80	.82
July 29	.22	.34	.47	.59	.85	1.16	1.36	1.51	1.53	1.54	1.55	1.56
July 29	.31	.53	.68	.83	1.06	1.26	1.33	1.34	1.34	1.34	1.35	1.35
Aug. 6	.35	.57	.68	.73	.77	.82	.83	.83	.83	.83	.83	.83
Aug. 8	.22	.34	.47	.58	.79	.92	.96	.99	1.01	1.01	1.02	1.03
Aug. 10	.38	.57	.79	.97	1.13	1.23	1.26	1.27	1.27	1.27	1.27	1.27
Aug. 30	.24	.44	.56	.59	.62	.63	.63	.63	.63	.63	.64	.64
Sept. 6	.31	.50	.58	.60	.62	.67	.81	.82	.82	.82	.82	.82
Sept. 16	.20	.36	.48	.60	.67	.74	.80	.83	.84	.85	.91	.93
Sept. 20	.20	.26	.38	.41	.41	.45	.45	.48	.52	.54	.54	.74
Sept. 21	.23	.44	.60	.68	.97	1.30	1.60	1.82	2.03	2.09	2.22	2.28
Nov. 6	.13	.22	.31	.42	.59	.76	.85	.97	1.03	1.08	1.23	1.25
Dec. 3	.15	.27	.34	.40	.56	.67	.75	.81	.81	.82	.87	.95
Dec. 14	.21	.31	.36	.38	.41	.46	.49	.50	.50	.50	.50	.50
Tampa Airport												
Mar. 12	.18	.29	.35	.52	.65	.73	.86	.88	.94	.95	.96	.96
May 12	.63	1.01	1.29	1.39	1.40	1.42	1.42	1.43	1.43	1.43	1.43	1.44
June 11	.30	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33
July 15	.15	.29	.39	.43	.44	.45	.46	.46	.47	.47	.48	.48
July 22	.28	.50	.76	.95	1.22	1.49	1.71	1.77	1.77	1.81	1.97	1.97
July 24	.21	.36	.47	.61	.73	.90	.99	1.01	1.03	1.05	1.09	1.12
July 29	.17	.22	.36	.38	.40	.52	.53	.54	.55	.55	.70	.80
Aug. 2	.39	.67	.95	1.13	1.31	1.34	1.37	1.46	1.51	1.51	1.55	1.56
Aug. 5	.32	.50	.57	.67	.83	.88	.89	.90	.90	.91	.96	1.01
Aug. 11	.22	.38	.48	.56	.69	.78	1.17	1.24	1.24	1.24	1.25	1.25
Aug. 21	.16	.31	.39	.47	.49	.52	.61	.64	.64	.64	.64	.91
Aug. 25	.26	.54	.73	.82	.85	.86	.92	.98	1.00	1.05	1.05	1.05
Sept. 8	.23	.42	.52	.56	.58	.59	.60	.60	.60	.60	.60	.60
Sept. 17–18	.16	.29	.43	.53	.72	.79	.83	.88	.94	.98	1.03	1.31
Sept. 18	.14	.29	.43	.49	.50	.78	.88	.96	1.32	1.54	1.54	1.54
Sept. 28	.38	.77	1.11	1.34	1.61	1.78	1.81	1.89	1.95	2.02	2.13	2.29
Nov. 16	.28	.46	.66	.87	1.17	1.49	1.54	1.60	1.62	1.67	1.72	1.72
Dec. 15	.22	.37	.43	.45	.47	.43	.50	.51	.51	.52	.52	.52

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
GEORGIA												
Atlanta Airport												
Feb. 20	0.67	0.97	1.12	1.23	1.32	1.71	2.11	2.32	2.34	2.34	2.34	2.34
June 16	.37	.50	.56	.68	.77	.77	.77	.78	.78	.78	.78	.78
June 28	.34	.55	.65	.72	.81	.89	.89	.89	.89	.89	.89	.89
July 26	.37	.72	1.07	1.30	1.93	1.95	1.97	1.97	1.97	1.97	1.97	1.97
July 29	.55	.78	.90	.95	1.00	1.16	1.21	1.26	1.26	1.26	1.26	1.26
July 29	.26	.50	.73	.79	.81	.81	.81	.81	.81	.81	.81	.81
Aug. 16	.25	.45	.61	.73	.88	.88	.88	.88	.88	.88	.88	.88
Sept. 10	.32	.45	.56	.59	.64	.65	.67	.73	.78	.80	.83	.83
Oct. 24	.20	.35	.45	.47	.48	.52	.57	.62	.63	.64	.64	.64
Dec. 4	.20	.35	.45	.52	.65	.73	.78	.88	.90	.98	1.03	1.03
Dec. 21	.25	.28	.32	.34	.37	.42	.50	.64	.66	.68	.87	.96
Augusta Airport												
June 8	.15	.27	.34	.41	.54	.55	.55	.55	.55	.55	.55	.55
June 8	.19	.24	.37	.48	.53	.53	.54	.54	.54	.55	.55	.55
July 13	.16	.23	.28	.36	.62	.73	.73	.73	.73	.73	.73	.73
July 26	.29	.56	.76	.86	.92	.96	.99	1.00	1.01	1.01	1.01	1.01
July 31–Aug. 1	.23	.40	.62	.75	.91	1.14	1.17	1.18	1.18	1.18	1.18	1.18
Aug. 10	.25	.30	.48	.54	.60	.65	.65	.67	.67	.68	.68	.68
Aug. 13	.22	.42	.44	.46	.47	.47	.47	.60	.60	.60	.60	.60
Sept. 14	.30	.45	.51	.55	.59	.59	.59	.59	.59	.60	.60	.60
Sept. 22	.54	.66	.83	.91	.92	1.09	1.10	1.17	1.18	1.24	1.38	1.62
Macon Airport												
June 13	.40	.75	1.01	1.12	1.24	1.45	1.54	1.56	1.57	1.58	2.69	2.84
June 26	.17	.30	.38	.43	.51	.65	.72	.84	.85	1.10	1.25	1.26
July 2	.27	.40	.49	.63	.65	.67	.67	.67	.67	.67	.67	.67
July 3	.30	.49	.65	.83	.93	1.01	1.03	1.03	1.03	1.03	1.03	1.03
July 17	.45	.79	.95	1.10	1.36	1.60	1.61	1.61	1.61	1.61	1.61	1.61
July 25	.37	.50	.56	.71	.87	.91	.92	.96	1.00	1.01	1.03	1.03
Aug. 9	.25	.34	.39	.43	.56	.76	.80	.93	1.10	1.14	1.22	1.25
Aug. 14	.21	.36	.44	.50	.54	.64	.72	.77	.78	.82	.85	.86
Nov. 1	.23	.40	.52	.56	.56	.56	.56	.56	.56	.56	.67	.68
Nov. 16	.39	.57	.66	.70	.70	.74	.76	.77	.77	.77	.77	.79
Savannah Airport												
Apr. 19	.31	.46	.59	.63	.65	.65	.65	.65	.65	.65	.65	.65
July 2	.23	.37	.46	.48	.48	.49	.53	.59	.61	.61	.61	.61
July 15	.15	.22	.29	.34	.50	.55	.59	.59	.59	.59	.59	.60
July 16	.19	.30	.39	.52	.63	.67	.68	.68	.68	.68	.68	.68
July 24	.25	.42	.49	.61	.96	1.15	1.45	1.52	1.53	1.54	1.54	1.54
July 27	.50	.91	1.29	1.41	1.49	1.49	1.49	1.49	1.49	1.50	1.50	1.50
July 28	.24	.40	.48	.53	.55	.58	.81	.85	1.07	1.09	1.46	1.50
July 30	.24	.33	.38	.39	.41	.41	.41	.41	.41	.41	.41	.41
Aug. 4	.41	.75	1.04	1.31	1.38	1.38	1.43	1.46	1.46	1.46	1.46	1.46
Aug. 15	.24	.33	.33	.33	.34	.34	.36	.36	.41	.41	.41	.56
Aug. 15	.18	.29	.36	.42	.46	.49	.53	.53	.53	.54	.54	.54
Aug. 19	.38	.53	.57	.57	.57	.68	.72	.75	.77	.77	.82	.84
Aug. 21	.23	.38	.46	.49	.55	.73	.73	.74	.74	.74	.74	.74
Aug. 23	.41	.76	1.16	1.43	1.91	2.54	3.02	3.66	4.05	4.33	4.58	4.58
Sept. 2	.17	.26	.37	.48	.49	.49	.49	.59	.60	.60	.60	.61
Sept. 2	.23	.37	.53	.63	.79	.86	.89	.90	.91	.92	.93	1.04
Sept. 6	.20	.33	.39	.43	.48	.51	.53	.54	.59	.63	.65	.65
Sept. 23	.17	.33	.39	.40	.40	.40	.40	.41	.41	.42	.42	.42
IDAHO												
Boise Airport						None						
ILLINOIS												
Cairo												
Feb. 20	.21	.31	.41	.49	.64	.87	.98	1.19	1.48	1.57	1.73	1.84
Feb. 20	.18	.27	.38	.45	.69	.84	.90	.97	1.02	1.06	1.08	1.08
Mar. 17	.26	.39	.53	.67	.86	.91	.95	1.01	1.11	1.19	1.22	1.25
Apr. 21	.15	.29	.43	.54	.71	1.03	1.14	1.25	1.28	1.37	1.50	1.60
May 21	.17	.30	.43	.52	.63	.67	.70	.71	.71	.71	.71	.71
June 2	.28	.41	.45	.58	.78	.85	.96	1.03	1.04	1.06	1.07	1.07
June 3	.25	.43	.51	.54	.61	.69	.75	.80	1.04	1.26	1.30	1.35
June 22	.26	.32	.32	.33	.33	.33	.34	.36	.36	.36	.36	.36
June 28	.44	.84	1.01	1.09	1.12	1.15	1.49	1.49	1.50	1.50	1.50	1.50
June 29	.27	.43	.59	.71	.79	.89	.92	.97	1.01	1.01	1.01	1.01
July 9	.12	.20	.29	.38	.56	.75	.78	.83	.86	.89	.92	.95
July 27	.29	.39	.42	.43	.45	.46	.46	.46	.46	.46	.46	.46
Aug. 27	.27	.43	.65	.78	.86	.87	1.35	1.67	1.81	1.85	1.85	1.85
Sept. 12–13	.25	.36	.56	.63	.73	.84	.92	1.24	1.32	1.38	1.47	1.59
Sept. 22	.17	.27	.38	.39	.39	.39	.39	.39	.39	.39	.40	.40
Nov. 13	.44	.55	.75	.75	.75	.75	.75	.75	.75	.75	.75	1.11
Dec. 6	.19	.28	.39	.50	.54	.66	.74	.83	.90	1.11	1.32	1.41
Chicago Airport												
Apr. 28	.46	.74	.85	.95	1.13	1.48	1.57	1.60	1.60	1.60	1.60	1.60
July 21	.31	.58	.81	.90	.98	1.04	1.07	1.08	1.09	1.10	1.11	1.12
Aug. 6	.22	.39	.43	.49	.68	.90	1.03	1.29	1.31	1.37	1.41	1.63
Aug. 13	.25	.38	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43
Aug. 20	.25	.40	.44	.46	.53	.58	.66	.72	.76	.82	.95	.99
Sept. 12	.19	.29	.35	.39	.50	.61	.70	.71	.71	.71	.71	.72
Sept. 26	.22	.34	.42	.52	.62	.93	1.22	1.41	1.53	1.61	1.72	1.80
Sept. 26	.27	.32	.32	.40	.49	.53	.55	.57	.57	.57	.57	.57
Moline Airport												
Apr. 28	.28	.43	.53	.58	.61	.62	.62	.62	.62	.62	.62	.62
June 19	.26	.44	.59	.60	.61	.65	.80	.84	.88	.95	1.09	1.11
July 8	.32	.41	.43	.44	.50	.55	.55	.55	.55	.55	.55	.55
July 16	.25	.34	.40	.42	.46	.46	.46	.46	.46	.46	.46	.46
July 22	.23	.35	.44	.53	.75	.89	1.05	1.11	1.15	1.21	1.27	1.31
Aug. 11	.20	.35	.43	.45	.43	.51	.53	.57	.57	.57	.57	.57
Aug. 15	.20	.30	.35	.37	.44	.52	.55	.57	.57	.57	.57	.57
Aug. 29	.55	1.00	1.35	1.60	2.25	3.00	3.28	3.46	3.73	4.54	4.58	4.60
Sept. 12	.35	.60	.70	.72	.76	.81	.82	.85	.90	.92	.93	.93
Sept. 26	.26	.37	.51	.60	.77	.82	.82	.83	.83	.88	.90	1.04
Peoria Airport												
June 7	.17	.28	.34	.38	.48	.66	.73	.81	.87	.88	.83	.88
July 8	.25	.42	.58	.65	.76	.91	1.24	1.34	1.42	1.44	1.45	1.45
July 16	.27	.36	.36	.36	.36	.36	.36	.36	.39	.39	.40	.41
July 21	.25	.45	.57	.66	.75	1.03	1.05	1.05	1.06	1.06	1.06	1.06
July 22	.16	.34	.46	.57	.64	.69	1.04	1.23	1.23	1.26	1.28	1.33
Aug. 6	.33	.52	.54	.56	.58	.60	.65	.91	.91	.93	1.04	1.11
Sept. 26	.37	.44	.44	.44	.44	.44	.62	.62	.62	.62	.62	.62
Springfield Airport												
Apr. 29	.39	.69	.96	1.24	1.59	2.03	2.21	2.37	2.43	2.50	2.50	2.50
June 27	.35	.54	.59	.62	.65	.68	.69	.69	.70	.70	.70	.70

Table 8—Continued

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1951

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
ILLINOIS (Cont'd.)												
Springfield Airport (Cont'd.)												
June 27–28	0.30	0.48	0.58	0.66	0.80	1.20	1.43	1.63	1.99	2.32	2.67	2.72
June 28	.45	.84	1.08	1.15	1.21	1.23	1.38	1.68	1.70	1.71	1.71	1.71
July 11	.35	.35	.35	.35	.36	.36	.38	.40	.53	.55	.63	.73
Sept. 1	.20	.38	.46	.58	.65	.70	.71	.73	.76	.77	.77	.77
INDIANA												
Fort Wayne Airport												
Feb. 18–19	.17	.27	.36	.42	.54	.59	.65	.72	.75	.78	.81	.81
Apr. 28	.32	.50	.60	.65	.67	.69	.69	.70	.70	.70	.71	.72
May 10	.38	.43	.46	.48	.56	.62	.69	.76	.78	.80	.84	1.12
June 19	.18	.34	.51	.66	.78	1.08	1.17	1.34	1.42	1.44	1.45	1.46
June 27	.24	.30	.41	.46	.50	.69	.91	.95	.97	1.00	1.00	1.00
July 4	.31	.61	.84	.95	.95	.95	.95	.95	.95	.95	.95	.95
July 8	.30	.50	.56	.57	.57	.64	.66	.66	.68	.68	.68	.68
July 27	.35	.47	.57	.57	.57	.57	.57	.57	.57	.57	.61	.67
Aug. 15	.30	.45	.47	.49	.50	.51	.51	.51	.51	.51	.51	.51
Nov. 13	.27	.29	.30	.31	.33	.36	.38	.38	.38	.38	.38	.38
Evansville Airport												
Feb. 20	.41	.45	.46	.48	.51	.53	.57	.76	.90	1.02	1.17	1.29
July 28	.31	.61	.80	.90	1.04	1.06	1.07	1.07	1.07	1.07	1.07	1.07
Aug. 9	.35	.50	.78	.82	.86	.94	1.00	1.05	1.05	1.05	1.05	1.05
Nov. 13	.33	.53	.58	.63	.68	.86	.94	1.03	1.13	1.13	1.13	1.13
Dec. 6	.25	.35	.37	.40	.55	.75	.80	.89	.90	.95	1.00	1.13
Indianapolis Airport												
Mar. 29	.33	.50	.65	.72	.78	.82	.83	.84	.84	.85	.85	.85
June 3	.30	.43	.44	.44	.46	.46	.46	.46	.46	.46	.46	.46
June 12	.16	.30	.38	.41	.46	.50	.51	.52	.52	.53	.54	.57
July 9	.38	.61	.70	.81	1.01	1.14	1.21	1.28	1.36	1.44	1.57	1.62
Aug. 8	.35	.50	.59	.65	.68	.68	.69	.69	.69	.69	.69	.69
South Bend Airport	Excessive precipitation records began July 1, 1951.											
July 8	.23	.35	.39	.43	.48	.60	.62	.63	.63	.63	.63	.63
July 27	.53	.73	1.25	1.50	1.87	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Aug. 14	.80	1.25	1.48	1.74	2.03	2.27	2.34	2.35	2.35	2.35	2.35	2.35
Sept. 26	.60	.64	.67	.70	.75	.76	.80	1.04	1.12	1.14	1.14	1.19
Terre Haute Airport												
June 27	.28	.46	.54	.65	.76	.78	.80	.82	.82	.82	.82	.82
July 9	.26	.45	.56	.64	.83	1.15	1.42	1.60	1.81	1.83	1.86	1.86
July 27	.38	.62	.88	1.13	1.35	1.50	1.58	1.61	1.62	1.62	1.62	1.62
IOWA												
Burlington Airport												
June 7	.28	.34	.38	.41	.45	.48	.50	.52	.59	.59	.65	.66
July 16	.52	.88	1.23	1.49	1.71	1.76	1.77	1.77	1.77	1.77	1.77	1.77
July 26–27	.31	.61	.79	.88	1.00	1.00	1.00	1.08	1.36	1.97	2.20	2.23
Aug. 25	.28	.46	.64	.71	.76	.87	.92	1.00	1.04	1.05	1.12	1.20
Charles City												
Apr. 28	.24	.45	.53	.65	.68	.73	.95	1.07	1.24	1.25	1.25	1.38
May 1	.32	.37	.41	.43	.45	.50	.54	.56	.57	.57	.59	.60
June 26	.19	.28	.35	.41	.44	.52	.56	.61	.63	.66	.69	.69
July 8			.23	.35	.50	.50	.51	.53	.55	.57	.61	.61
Aug. 7	.47	.77	.87	.94	1.03	1.13	1.16	1.16	1.17	1.17	1.17	1.17
Aug. 19	.26	.43	.50	.54	.64	.67	.69	.89	1.08	1.10	1.11	1.11
Aug. 25	.32	.56	.78	.97	1.15	1.22	1.24	1.28	1.28	1.28	1.28	1.28
Davenport												
Apr. 27	.25	.26	.38	.62	.63	.65	.89	.89	.89	.89	.89	.90
Apr. 28	.17	.30	.38	.40	.49	.51	.51	.51	.51	.51	.51	.51
June 12	.33	.53	.78	.83	.92	.93	.95	.95	.95	.95	.95	.95
June 27	.30	.56	.58	.60	.61	.64	.64	.64	.64	.64	.64	.64
July 8	.40	.50	.63	.70	.74	.79	.83	.84	.84	.84	.84	.84
July 26–27	.15	.30	.38	.45	.54	.60	.60	.80	.97	1.03	1.03	1.03
Aug. 14	.35	.54	.55	.57	.60	.64	.64	.68	.68	.68	.69	.69
Aug. 15	.30	.40	.55	.60	.86	1.02	1.07	1.08	1.08	1.08	1.08	1.08
Aug. 29	.26	.40	.51	.71	.92	1.10	1.34	1.44	1.54	1.54	1.86	2.02
Sept. 9	.17	.30	.35	.38	.40	.42	.43	.44	.44	.45	.48	.52
Sept. 26	.20	.32	.45	.50	.64	.73	.80	.90	.90	.93	.94	1.02
Des Moines Airport												
May 25	.24	.45	.51	.54	.81	.93	.95	.97	.98	1.01	1.02	1.04
July 2	.33	.52	.63	.72	.86	.99	1.18	1.36	1.62	1.70	1.75	1.83
July 11	.22	.35	.45	.52	.63	.68	.68	.68	.68	.68	.68	.68
Aug. 14–15	.35	.46	.53	.54	.56	.61	.68	.76	.81	.81	.81	.81
Dubuque Airport												
Apr. 29	.25	.28	.29	.29	.30	.30	.48	.70	.75	.80	.84	.85
July 8	.25	.43	.51	.65	.77	.96	1.05	1.11	1.20	1.20	1.20	1.20
July 8	.27	.50	.65	.67	.71	.76	.77	.77	.77	.84	.85	.85
July 8	.25	.31	.40	.52	.76	1.02	1.29	1.32	1.33	1.39	1.40	1.43
Oct. 4	.36	.60	.93	1.07	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12
Sioux City Airport												
Apr. 29	.26	.27	.27	.27	.28	.30	.30	.31	.31	.31	.31	.31
June 19	.52	.73	.78	.81	.86	.93	.93	.93	.94	.94	.94	.94
July 26	.34	.57	.71	.75	.76	.76	.77	.77	.77	.77	.77	.77
Aug. 9	.24	.42	.48	.55	.58	.62	.65	.70	.71	.73	.77	.79
Aug. 12	.22	.39	.49	.59	.73	.75	.77	.79	.80	.82	.83	.84
Aug. 14	.32	.54	.68	.76	.80	.84	.86	.86	.86	.86	.86	.87
Aug. 14	.44	.74	.96	1.11	1.30	1.35	1.40	1.50	1.60	1.67	1.75	1.75
Aug. 26	.32	.56	.78	.83	.89	.92	.94	.94	.95	.95	.95	.95
Sept. 11	.17	.28	.37	.52	.63	.79	.98	1.14	1.24	1.39	1.52	1.56
Oct. 3	.17	.31	.55	.61	.67	.88	.96	1.08	1.14	1.16	1.17	1.18
KANSAS												
Concordia												
May 25	.26	.40	.46	.51	.56	.56	.56	.56	.56	.56	.56	.56
June 21	.60	1.10	1.47	1.72	2.01	2.53	2.62	2.69	2.69	3.25	3.30	3.72
June 22	.16	.31	.46	.60	.76	.89	.99	1.10	1.16	1.27	1.41	1.52
June 28	.18	.29	.37	.42	.47	.53	.53	.56	.62	.65	.65	.65
July 21	.20	.30	.32	.35	.41	.43	.48	.50	.80	.88	.91	.95
Aug. 19	.48	.70	.91	1.04	1.16	1.30	1.36	1.41	1.45	1.48	1.52	1.54
Sept. 4	.20	.41	.50	.55	.63	.65	.67	.69	.71	.86	1.15	1.24
Sept. 24	.21	.41	.50	.53	.60	.66	.66	.66	.67	.68	.69	.69
Oct. 2	.21	.37	.39	.39	.39	.39	.39	.39	.39	.39	.39	.39

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
KANSAS (Cont'd.)												
Dodge City Airport												
Apr. 26	0.40	0.47	0.55	0.60	0.64	0.65	0.65	0.65	0.65	0.65	0.65	0.66
May 9	.22	.37	.45	.60	.75	.80	.84	.86	.87	.88	.88	.89
May 20	.19	.30	.36	.40	.48	.53	.55	.59	.59	.59	.59	.59
May 21	.50	.81	1.11	1.40	1.76	1.93	2.00	2.04	2.08	2.15	2.23	2.30
June 6	.23	.32	.39	.48	.67	.75	.77	.78	.78	.81	.83	.83
June 8–9	.21	.37	.50	.63	.89	.93	.94	.94	.96	.96	.96	.96
June 20–21	.31	.50	.61	.75	.97	1.20	1.37	1.37	1.43	1.65	1.66	1.66
June 29	.29	.38	.38	.39	.39	.39	.44	.44	.45	.45	.45	.45
June 29	.21	.35	.37	.37	.39	.39	.40	.42	.44	.44	.44	.44
July 10	.45	.84	.95	1.00	1.40	1.68	1.71	1.71	1.71	1.76	1.77	1.95
July 11	.52	.90	1.14	1.30	1.34	1.34	1.36	1.36	1.36	1.36	1.36	1.38
Goodland Airport												
Apr. 20	.20	.35	.38	.45	.47	.52	.56	.62	.64	.66	.68	.68
June 10	.25	.40	.50	.56	.65	.73	.74	.84	1.06	1.10	1.13	1.17
June 21	.45	.80	1.08	1.30	1.63	1.82	2.00	2.16	2.19	2.20	2.20	2.20
July 7	.25	.26	.27	.31	.35	.37	.37	.37	.37	.37	.37	.37
July 10–11	.20	.30	.32	.34	.35	.41	.42	.43	.43	.43	.44	.44
July 12	.30	.40	.60	.75	.90	1.03	1.10	1.16	1.20	1.48	1.55	1.60
Aug. 10	.30	.50	.58	.62	.64	.66	.68	.69	.70	.70	.70	.70
Sept. 2	.30	.39	.40	.41	.42	.42	.42	.42	.42	.42	.42	.42
Topeka												
May 9	.38	.74	.81	.86	.93	.94	.94	.96	.96	.96	.96	.96
June 6	.12	.20	.27	.42	.53	.62	.64	.64	.64	.64	.64	.64
*June 8	(.30)	(.46)	(.67)	(.72)	(.75)	(.81)	(.81)	(.84)	(.85)	.86	.86	.86
June 15	.32	.48	.55	.56	.58	.59	.59	.63	.71	.75	.95	.95
June 15	.30	.44	.59	.61	.61	.61	.61	.61	.61	.61	.61	.61
June 18	.26	.31	.33	.36	.39	.41	.41	.41	.41	.41	.41	.41
June 22	.29	.48	.50	.56	.68	.78	.98	1.04	1.09	1.09	1.18	1.18
June 26	.31	.47	.56	.63	.76	.92	.93	1.02	1.13	1.16	1.20	1.72
July 11–12	.17	.35	.50	.68	.87	1.13	1.14	1.16	1.28	1.46	1.59	1.85
July 26	.20	.38	.54	.61	.86	.93	.98	1.03	1.03	1.03	1.03	1.03
Aug. 25	.24	.42	.49	.54	.72	.72	.72	.73	.78	.83	.83	.83
Aug. 25	.24	.39	.44	.53	.55	.55	.57	.57	.58	.70	.79	.90
Sept. 4	.19	.37	.48	.54	.66	.75	.78	.82	.83	.86	.94	.99
Oct. 5	.43	.56	.59	.60	.61	.61	.61	.63	.70	.71	.71	.75
Wichita Airport												
Mar. 27	.27	.42	.48	.51	.77	1.09	1.40	1.63	1.68	1.71	1.73	1.73
Apr. 27	.42	.60	.65	.68	.81	1.05	1.07	1.10	1.11	1.28	1.96	1.99
Apr. 30	.24	.38	.48	.57	.72	.87	.92	.99	1.10	1.16	1.22	1.29
May 9	.33	.55	.69	.76	.79	.94	1.25	1.26	1.29	1.30	1.31	1.34
May 16	.25	.35	.45	.55	.64	.70	.79	.85	.95	.98	1.11	1.18
May 17	.19	.39	.50	.59	.66	.73	.79	.88	.98	.99	.99	.99
May 21	.15	.28	.33	.40	.56	.66	.70	.70	.70	.70	.70	.70
June 6	.41	.56	.74	.89	1.20	1.47	1.57	1.60	1.68	1.70	1.71	1.72
June 21	.24	.36	.41	.49	.60	.62	.64	.66	.67	.69	.70	.71
June 21	.12	.30	.34	.35	.35	.36	.36	.36	.36	.36	.36	.36
June 23	.36	.66	.69	.69	.69	.69	.82	.88	.88	.88	.88	.89
June 29	.34	.56	.84	.92	.98	.99	.99	1.16	1.23	1.35	1.39	1.48
July 23	.37	.62	.78	.98	1.17	1.73	1.96	2.07	2.18	2.38	2.45	2.51
Aug. 9	.38	.56	.63	.69	.73	.80	.85	.86	.86	.86	.96	1.12
Aug. 13	.25	.31	.38	.48	.59	.61	.62	.72	.79	.80	.80	.80
Sept. 4	.15	.28	.34	.44	.56	.60	.64	.65	.68	.71	.72	.74
Sept. 12	.25	.38	.51	.67	.92	1.05	1.26	1.30	1.34	1.40	1.41	1.47
Sept. 24	.27	.43	.55	.66	.85	1.14	1.43	1.54	1.66	1.66	1.66	1.66
KENTUCKY												
Louisville Airport												
May 10	.41	.47	.49	.51	.51	.51	.51	.51	.85	.89	.89	.89
May 22	.64	.92	.95	.96	.98	1.04	1.09	1.12	1.13	1.13	1.13	1.17
June 8	.26	.33	.50	.56	.63	.63	.63	.64	.64	.64	.67	.69
July 10	.20	.40	.60	.65	.65	.65	.65	.65	.65	.65	.65	65
July 24	.25	.45	.48	.50	.59	.61	.61	.62	.65	.65	.68	.70
Aug. 9	.30	.39	.40	.41	.42	.42	.43	.45	.45	.45	.45	.45
Aug. 11	.25	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31	.31
Sept. 10	.25	.40	.50	.53	.53	.53	.53	.53	.53	.53	.56	.56
Oct. 23	.14	.25	.31	.37	.45	.73	.81	.91	.94	.95	1.06	1.10
LOUISIANA												
New Orleans												
Jan. 23	.15	.26	.39	.45	.58	.80	.85	1.06	1.27	1.37	1.49	1.49
Mar. 28	.27	.44	.58	.66	.73	.99	1.28	1.53	1.69	1.77	2.12	2.23
Mar. 28	.22	.34	.43	.50	.63	.92	1.01	1.12	1.17	1.45	1.67	1.84
Apr. 7	.26	.44	.56	.66	.71	.71	.72	.76	.80	.80	.80	.91
Apr. 16	.26	.40	.45	.49	.53	.56	.61	.70	.78	.83	.96	.98
May 11	.22	.37	.53	.67	.72	.76	.78	.81	.85	.88	.90	.90
June 4	.46	.83	1.02	1.10	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
June 5	.42	.61	.77	.94	1.37	1.63	1.79	1.80	1.80	1.80	1.80	1.80
June 9	.33	.41	.41	.41	.41	.41	.41	.41	.41	.41	.41	.41
July 23	.20	.22	.30	.43	.49	.55	.58	.58	.58	.58	.58	.58
Aug. 15	.27	.42	.53	.58	.70	.70	.70	.70	.70	.70	.70	.70
Aug. 31	.38	.70	1.03	1.23	1.42	1.45	1.45	1.45	1.45	1.45	1.45	1.45
Shreveport Airport												
Feb. 6	.20	.31	.36	.39	.41	.48	.49	.50	.50	.50	.57	.61
Mar. 17	.29	.35	.37	.41	.47	.51	.51	.52	.52	.53	.53	.53
June 10	.22	.36	.42	.44	.47	.48	.53	.58	.65	.70	.73	.73
June 12	.22	.30	.41	.50	.57	.61	.66	.66	.66	.66	.66	.66
July 1	.36	.66	.82	.95	1.03	1.13	1.14	1.15	1.17	1.18	1.18	1.18
July 23	.22	.35	.42	.50	.56	.60	.60	.60	.61	.61	.61	.61
Sept. 4	.29	.45	.59	.62	.63	.64	.64	.64	.64	.64	.64	.64
Sept. 27	.15	.27	.34	.41	.51	.64	.69	.72	.75	.77	.80	.81
Dec. 8	.25	.41	.60	.79	.84	.93	.97	1.05	1.24	1.37	1.50	1.55
Dec. 25	.53	.61	.62	.62	.63	.68	.68	.69	.70	.72	1.02	1.05
MAINE												
Eastport						None						
Portland Airport												
Oct. 25	.19	.30	.41	.52	.65	.80	.92	1.02	1.09	1.16	1.18	1.25
Nov. 3	.14	.24	.36	.45	.65	.85	1.00	1.22	1.40	1.62	1.81	1.99
MARYLAND												
Baltimore Airport												
Apr. 12	.35	.39	.40	.44	.48	.49	.50	.50	.52	.52	.52	.63
May 11	.23	.30	.33	.35	.35	.36	.37	.40	.48	.52	.59	.69
May 23	.18	.30	.38	.42	.49	.51	.52	.52	.62	.80	.89	.93

* Gage not recording; amounts estimated from airport recorder adjusted to total rainfall.

Table 8—Continued

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1951

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
MARYLAND (Cont'd.)												
Baltimore Airport (Cont'd.)												
June 22	0.19	0.36	0.53	0.67	0.81	0.85	0.94	0.99	1.02	1.09	1.19	1.20
July 15	.21	.35	.37	.37	.39	.40	.40	.40	.40	.40	.40	.40
July 28	.12	.26	.33	.44	.56	.74	.82	.83	.89	.96	1.01	1.02
Aug. 3	.19	.31	.40	.51	.57	.57	.58	.58	.58	.58	.58	.58
Sept. 2	.28	.47	.62	.68	.90	1.49	1.75	1.81	1.81	1.81	1.81	1.81
Sept. 14	.35	.59	.80	.91	1.09	1.15	1.53	1.60	1.64	1.87	1.87	1.92
MASSACHUSETTS												
Boston Airport												
June 17	.23	.46	.61	.68	.74	.89	.93	.98	.99	.99	.99	.99
July 19	.32	.46	.53	.56	.57	.58	.58	.59	.60	.60	.60	.60
Aug. 16	.19	.33	.38	.39	.41	.54	.70	.75	.82	.88	.99	1.14
Aug. 20	.40	.49	.57	.61	.62	.63	.63	.63	.63	.96	.96	.98
Oct. 25	.26	.35	.41	.45	.51	.57	.65	.71	.78	.87	.93	.97
Nantucket Airport												
June 25	.27	.33	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36
July 17	.19	.33	.41	.46	.48	.50	.53	.56	.56	.56	.58	.59
July 23	.26	.32	.33	.34	.35	.37	.41	.42	.43	.43	.43	.43
Oct. 5	.14	.21	.36	.41	.46	.47	.47	.48	.52	.59	.67	.74
Pittsfield Airport												
July 10	.20	.30	.40	.46	.56	.66	.70	.73	.73	.73	.73	.73
July 19	.25	.40	.50	.60	.65	.67	.75	.80	.82	.85	.85	.89
Aug. 9	.15	.27	.37	.42	.55	.56	.56	.56	.56	.56	.56	.56
MICHIGAN												
Alpena												
May 20	.23	.40	.44	.47	.50	.52	.53	.54	.54	.54	.54	.54
July 26	.20	.31	.40	.41	.43	.45	.46	.49	.51	.54	.58	.61
Aug. 2	.36	.51	.53	.55	.58	.61	.62	.98	1.05	1.06	1.06	1.08
Aug. 31	.26	.48	.64	.65	.67	.68	.69	.71	.72	.72	.72	.72
Detroit Airport												
May 20	.25	.44	.58	.64	.69	.74	.77	.83	.90	.96	1.02	1.05
July 4	.43	.90	.97	.97	.97	.97	.97	.97	.97	.97	.97	.97
July 21-22	.32	.35	.41	.52	.53	.62	.73	1.05	1.05	1.26	1.58	1.58
Aug. 18	.19	.37	.47	.54	.62	.66	.67	.67	.67	.67	.67	.67
Aug. 31	.20	.35	.60	.70	.77	.79	.79	.93	1.02	1.02	1.02	1.02
Escanaba												
June 20	.25	.34	.51	.43	.47	.59	.66	.68	.69	.69	.69	.69
July 7	.16	.26	.35	.40	.57	.63	.67	.79	.91	.95	1.01	1.04
July 26	.41	.76	1.08	1.33	1.50	1.68	1.74	2.33	3.06	3.16	3.16	3.21
Grand Rapids												
June 13			1.05		1.21	1.23	1.23			1.23	1.23	1.23
June 19			.72		.91	1.02	1.20			1.95	2.04	2.14
Aug. 2	.27	.40	.52	.53	.54	.56	.56	.56	.56	.56	.56	.56
Aug. 20	.25	.40	.57	.59	.60	.62	.64	.64	.64	.64	.64	.64
Aug. 27	.25	.45	.68	.72	.73	.73	.73	.73	.73	.73	.73	.73
Sept. 22	.31	.33	.36	.41	.43	.56	.60	.64	.79	.92	.92	.92
Oct. 1	.25	.43	.46	.47	.49	.50	.50	.50	.50	.50	.50	.50
Nov. 13	.18	.28	.40	.43	.50	.64	.70	.81	.83	.83	.90	.90
Lansing Airport												
June 1	.18	.35	.47	.49	.51	.55	.56	.62	.65	.66	.67	.67
June 19	.23	.31	.48	.55	.57	.63	.70	.76	.78	.78	.79	.82
Aug. 31	.25	.40	.61	.76	1.03	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Oct. 1	.19	.34	.44	.48	.54	.60	.61	.61	.61	.61	.61	.61
Marquette												
June 19-20			.38		.57	.76	.95			1.00	1.36	1.40
July 7-8	.23	.33	.42	.43	.46	.52	.59	.63	.65	.67	.68	.68
Aug. 30-31	.17	.23	.38	.41	.45	.55	.63	.68	.77	.90	1.09	1.17
Ypsilanti Airport												
July 21-22	.38	.66	.90	1.00	1.16	1.24	1.34	1.64	1.98	2.18	2.28	2.32
MINNESOTA												
Duluth Airport												
July 6	.21	.30	.44	.51	.60	.62	.62	.62	.62	.62	.62	.62
July 20	.15	.16	.25	.39	.52	.52	.52	.52	.52	.52	.52	.52
July 30	.38	.49	.54	.55	.60	.63	.64	.64	.68	.70	.74	.75
Aug. 2	.40	.63	.64	.66	.66	.66	.66	.66	.66	.66	.66	.66
Aug. 28	.20	.35	.42	.45	.48	.55	.60	.65	.69	.73	.74	.77
Aug. 28	.17	.23	.26	.30	.45	.61	.70	.99	1.20	1.46	1.60	1.76
Minneapolis												
May 18	.28	.37	.41	.42	.61	.70	.71	.71	.71	.71	.71	.71
*July 20	.34	.74	.94	.96	1.00	1.14	1.23	1.47	1.55	1.71	1.80	1.85
*July 20-21	.25	.45	.58	.67	.87	.96	1.06	1.10	1.11	1.12	1.15	1.30
Sept. 5	.26	.30	.31	.35	.36	.36	.36	.36	.36	.36	.36	.36
Sept. 11	.17	.27	.32	.41	.53	.59	.67	.67	.67	.68	.68	.68
Saint Cloud Airport												
June 8	.35	.51	.60	.64	.66	.67	.67	.67	.67	.67	.67	.67
June 19	.40	.60	.81	.91	1.03	1.16	1.18	1.19	1.19	1.19	1.19	1.19
July 7	.85	1.07	1.19	1.21	1.32	1.90	2.11	2.26	2.26	2.26	2.26	2.26
July 15	.26	.31	.42	.48	.54	.60	.65	.65	.65	.65	.65	.65
Aug. 7	.25	.30	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35
Aug. 16	.29	.34	.35	.36	.40	.40	.40	.75	.77	.78	.81	.81
Aug. 25	.30	.34	.46	.62	.64	.74	.75	.75	.75	.83	1.00	1.21
Aug. 28	.27	.31	.40	.41	.45	.49	.50	.50	.50	.50	.50	.50
Aug. 30	.32	.38	.45	.47	.48	.53	.55	.57	.60	.60	.60	.60
Sept. 11	.30	.55	.57	.61	.62	.63	.63	.63	.63	.63	.63	.63
Oct. 2	.30	.50	.67	.75	.90	.92	.92	.92	.92	.92	.92	.92
St. Paul Airport												
July 7	.27	.49	.50	.50	.51	.53	.53	.53	.53	.53	.53	.53
July 20	.34	.74	.94	.96	1.00	1.14	1.23	1.47	1.55	1.71	1.80	1.85
July 20-21	.25	.45	.58	.67	.87	.96	1.06	1.10	1.11	1.12	1.15	1.30
July 30	.25	.34	.42	.43	.45	.49	.55	.62	.77	.89	1.12	1.15
Aug. 7	.22	.38	.60	.83	.96	1.29	1.35	1.37	1.37	1.37	1.38	1.38
Sept. 12	.18	.32	.42	.52	.66	.88	.92	.98	1.14	1.20	1.23	1.37
Sept. 20	.26	.27	.28	.28	.28	.28	.28	.44	.45	.49	.49	.49
MISSISSIPPI												
Jackson Airport												
Apr. 7	.20	.34	.34	.34	.34	.31	.34	.34	.34	.34	.34	.53

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
MISSISSIPPI (Cont'd.)												
Jackson Airport (Cont'd.)												
Apr. 21	0.29	0.39	0.46	0.52	0.56	0.61	0.65	0.72	0.84	0.88	0.88	0.88
Apr. 21	.45	.72	1.09	1.33	1.78	2.08	2.20	2.45	2.50	2.50	2.55	2.56
July 2	.25	.35	.45	.52	.55	.57	.62	.63	.64	.64	.64	.64
July 9	.20	.30	.35	.37	.40	.41	.41	.41	.41	.41	.41	.41
July 22	.25	.43	.45	.50	.52	.56	.56	.56	.56	.56	.56	.56
Aug. 17	.27	.42	.57	.59	.60	.60	.61	.62	.62	.62	.62	.62
Aug. 21	.30	.50	.65	.80	1.00	1.20	1.30	1.35	1.36	1.37	1.37	1.37
Dec. 3	.25	.40	.44	.46	.48	.53	.57	.58	.60	.64	.66	.68
Dec. 8	.35	.55	.58	.63	.65	.68	.70	.74	.82	.93	1.09	1.14
Dec. 20	.25	.32	.38	.40	.46	.66	.72	.73	.74	.74	.75	.82
Meridian Airport												
Oct. 12	.12	.30	.51	.63	.70	.70	.70	.70	.70	.70	.70	.70
Vicksburg												
Jan. 2-3	.51	.64	.81	.84	.86	.96	1.02	1.03	1.03	1.04	1.04	1.05
Mar. 27	.40	.70	.94	.98	1.13	(1.35	1.65	1.95	2.30	2.65	3.10	3.50)**
Apr. 19	.30	.48	.67	.76	.79	.81	.83	.83	.83	.83	.83	.83
Apr. 21	.45	.63	.73	.82	1.39	1.52	1.52	1.52	1.52	1.52	1.53	1.55
June 10	.41	.58	.78	1.00	1.19	1.21	1.23	1.24	1.26	1.27	1.38	1.45
June 16	.26	.33	.36	.38	.40	.41	.42	.43	.43	.43	.43	.43
June 28	.19	.29	.37	.50	.63	.70	.70	.70	.70	.70	.70	.70
June 29	.25	.33	.33	.33	.33	.33	.33	.40	.40	.40	.55	.55
July 1	.43	.59	.64	.66	.67	.69	.71	.71	.71	.71	.71	.71
July 2	.33	.48	.58	.62	.63	.66	.70	.70	.70	.70	.70	.70
July 28	.33	.62	.82	1.06	1.25	1.30	1.32	1.35	1.37	1.39	1.41	1.42
Sept. 10	.38	.51	.60	.61	.64	.68	.68	.68	.68	.68	.68	.68
Sept. 13	.25	.37	.45	.50	.68	.74	.83	.90	.92	.92	.94	1.00
Sept. 24	.40	.59	.86	1.07	1.28	1.53	1.57	1.71	1.76	1.97	2.00	2.20
Oct. 23	.17	.32	.43	.46	.47	.52	.52	.52	.52	.52	.52	.52
Dec. 7	.29	.45	.53	.63	.71	.86	.89	.89	.89	.89	.89	.89
MISSOURI												
Columbia Airport												
May 9	.22	.36	.57	.71	.75	.77	.80	.84	.87	.96	1.07	1.07
June 23	.35	.55	.70	.79	.86	.89	.90	.92	.92	.92	.93	.93
July 11	.35	.45	.46	.47	.53	.56	.65		1.22	1.30	1.41	1.43
July 11	.18	.41	.46	.49	.54	.62	.67	.77				
July 23							1.20		1.22		1.25	1.25
July 27-28	.18	.30	.42	.47	.61	.82	.91	.95	.96	.97	.97	.97
Aug. 3	.30	.55	.73	.73	.73	.73	.73	.73	.73	.73	.73	.81
Aug. 9	.30	.45	.47	.52	.63	.67	.73	.75	.76	.76	.76	.78
Aug. 15	.23	.39	.48	.51	.73	.83	.91	.98	1.05	1.28	1.63	1.85
Aug. 20	.36	.43	.44	.46	.51	.53	.53	.72	.74	.74	.75	.80
Sept. 12	.25	.40	.45	.49	.55	.57	.67	.71	.74	.79	.87	.90
Kansas City Airport						None						
St. Joseph Airport												
Apr. 30	.26	.32	.38	.41	.49	.55	.70	1.03	1.26	1.39	1.48	1.53
May 25	.36	.37	.38	.38	.38	.41	.69	.71	.71	.71	.71	.71
June 2	.22	.35	.43	.49	.70	.88	.95	.96	.97	1.07	1.13	1.15
June 11	.24	.47	.70	.72	.73	.75	.77	.80	.80	.81	.82	.82
June 21	.27	.54	.80	1.06	1.40	1.87	1.97	2.04	2.09	2.25	2.69	2.84
June 22	.24	.46	.59	.66	.83	.98	1.10	1.20	1.27	1.31	1.33	1.40
June 27	.32	.37	.40	.42	.45	.49	.50	.51	.51	.51	.52	.52
July 5	.25	.40	.46	.48	.50	.50	.51	.52	.53	.55	.57	.57
July 5	.25	.34	.40	.46	.53	.57	.58	.62	.65	.65	.65	.65
Aug. 2	.17	.27	.38	.44	.46	.50	.50	.50	.50	.50	.51	.53
Aug. 3	.17	.32	.41	.46	.52	.52	.53	.54	.60	.71	.80	.82
Aug. 14	.24	.39	.54	.65	.89	1.06	1.14	1.29	1.33	1.33	1.33	1.33
Aug. 15	.22	.35	.48	.56	.66	.72	.74	.83	.98	1.04	1.04	1.04
Aug. 31	.34	.62	.81	.89	1.00	1.05	1.05	1.08	1.09	1.09	1.09	1.09
Sept. 4	.18	.31	.45	.51	.56	.66	.70	.75	.80	.86	.97	1.05
Sept. 9	.25	.40	.62	.64	.65	.68	.70	.73	.78	.99	1.31	1.38
Nov. 12	.18	.32	.41	.49	.65	.95	1.02	1.09	1.17	1.23	1.27	1.27
St. Louis												
June 25	.30	.50	.80	.93	.95	1.00	1.04	1.12	1.22	1.23	1.23	1.23
July 22	.28	.49	.74	.86	.89	.91	.95	.97	.99	1.00	1.00	1.00
Aug. 20	.25	.36	.40	.52	.76	.98	1.01	1.04	1.05	1.06	1.09	1.11
Sept. 12	.17	.27	.39	.45	.60	.74	.85	.88	.90	.91	.97	1.04
Springfield Airport												
Mar. 17	.25	.31	.32	.34	.34	.34	.34	.34	.34	.34	.34	.34
May 21	.21	.42	.46	.47	.48	.49	.49	.49	.49	.49	.49	.49
May 21	.21	.36	.47	.50	.53	.54	.56	.59	.60	.60	.60	.60
June 8	.18	.34	.42	.48	.50	.51	.52	.52	.52	.52	.52	.52
June 25	.28	.55	.59	.59	.60	.64	.66	.67	.67	.67	.67	.67
June 30	.18	.25	.38	.46	.51	.57	.60	.62	.65	.67	.71	.84
July 3	.32	.60	.81	1.11	1.28	1.79	2.17	2.30	2.36	2.36	2.65	3.67
Aug. 17	.50	.70	.92	.97	.98	1.00	1.02	1.03	1.04	1.04	1.04	1.04
Sept. 4	.25	.28	.35	.38	.40	.42	.44	.46	.49	.51	.52	.52
Sept. 24	.24	.26	.30	.40	.48	.67	.85	.99	1.05	1.25	1.29	1.33
Oct. 22	.16	.23	.35	.38	.43	.50	.53	.58	.63	.71	.71	.71
MONTANA												
Billings Airport						None						
Great Falls Airport												
June 22	.20	.32	.40	.45	.56	.56	.56	.56	.56	.56	.56	.56
Havre						None						
Helena Airport												
July 25	.36	.60	.61	.61	.61	.62	.62	.62	.62	.62	.62	.62
Missoula Airport						None						
NEBRASKA												
Lincoln												
June 1	.38	.62	.77	.84	1.09	1.36	1.74	1.97	2.07	2.21	2.72	3.04
June 10	.23	.38	.47	.53	.76	.78	.82	.83	.90	.90	.90	.90
June 14	.30	.46	.50	.56	.60	.67	.73	1.05	1.27	1.36	1.41	1.42
June 18	.22	.36	.47	.52	.57	.63	.70	.86	1.01	1.09	1.15	1.18
July 27	.44	.73	.95	1.07	1.15	1.17	1.17	1.17	1.17	1.17	1.17	1.17
Aug. 12	.16	.31	.41	.47	.57	.70	.74	.77	.79	.80	.80	.80
Aug. 14	.35	.48	.63	.68	.70	.73	.78	.91	1.07	1.12	1.12	1.12
Sept. 9	°.25	°.45	°.54	°.67	°.68	°.78	1.01	1.04	1.04	1.04	1.04	1.04

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* Data from St. Paul recording gage. Minneapolis gage put out of commission by storm.

** On March 27 rainfall totals for 45 to 180 minutes, inclusive, are estimated on the basis of rainfall records from the U. S. Waterways Experiment Station about 4 miles south of the Vicksburg City Office.

° Amounts estimated, tipping bucket not working correctly.

EXCESSIVE SHORT DURATION RAINFALL

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
NEBRASKA (Cont'd.)												
Norfolk Airport												
July 2	0.33	0.53	0.63	0.66	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Aug. 12	.25	.48	.70	.90	1.08	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Aug. 14	.32	.45	.60	.75	.90	1.10	1.25	1.27	1.30	1.30	1.30	1.30
Aug. 20	.25	.28	.32	.35	.50	.78	.85	.90	1.25	1.62	1.64	1.64
North Platte Airport												
May 13	.22	.30	.33	.34	.35	.35	.56	.60	.62	.67	.69	.83
May 14	.15	.25	.36	.48	.58	.74	.77	.87	.89	.94	1.01	1.07
May 30	.27	.48	.60	.72	.97	1.14	1.24	1.40	1.42	1.42	1.43	1.43
June 6	.21	.39	.53	.65	.78	.85	.91	.99	1.12	1.19	1.22	1.24
June 7	.33	.55	.72	.80	.90	1.10	1.10	1.11	1.12	1.12	1.57	1.77
June 8	.28	.45	.52	.56	.60	.65	.65	.88	.98	1.08	1.25	1.32
June 16–17	.20	.37	.49	.61	.73	.80	.81	.86	.92	.92	.92	.92
June 21	.34	.36	.36	.36	.43	.46	.54	.84	.87	.92	.99	1.08
June 23	.25	.38	.49	.64	.80	.85	1.13	1.15	1.15	1.16	1.17	1.18
June 25	.19	.29	.43	.44	.46	.47	.47	.57	.63	.64	.64	.64
July 17	.18	.40	.50	.56	.62	.66	.67	.67	.78	.78	.83	.89
July 28	.20	.37	.55	.62	.90	.92	1.00	1.02	1.07	1.08	1.12	1.12
Aug. 2	.18	.28	.35	.38	.39	.40	.40	.40	.40	.40	.40	.40
Aug. 12	.20	.35	.47	.55	.67	.88	.90	.90	.90	.90	.90	.90
Omaha Airport												
Apr. 29	.28	.56	.60	.63	.63	.64	.66	.67	.67	.90	1.01	1.02
Apr. 30	.40	.67	.72	.77	.90	.96	1.03	1.18	1.27	1.36	1.41	1.45
May 1	.17	.20	.23	.33	.52	.72	.90	.94	1.02	1.15	1.19	1.23
May 25	.30	.45	.55	.63	.75	.92	.93	.95	.99	1.00	1.00	1.00
May 31	.60	.78	1.02	1.10	1.14	1.15	1.19	1.23	1.24	1.24	1.24	1.24
June 1	.34	.37	.40	.46	.56	.60	.62	.64	.65	.68	.70	.77
July 3	.26	.42	.62	.71	.73	.73	.73	1.30	1.36	1.38	1.38	1.38
July 17	.27	.38	.50	.58	.75	.97	1.06	1.06	1.06	1.08	1.10	1.13
Aug. 2	.43	.50	.63	.68	.68	.68	.68	.68	.68	.68	.68	.68
Aug. 12	.20	.30	.41	.43	.46	.48	.50	.56	.68	.75	.85	.90
Aug. 14	.20	.25	.35	.45	.50	.65	.75	.75	.75	.75	.75	.75
Aug. 14	.20	.30	.39	.45	.48	.54	.64	.71	.80	.83	.84	.84
Aug. 14	.16	.36	.51	.53	.54	.57	.57	.57	.57	.57	.57	.57
Aug. 20	.30	.50	.64	.66	.70	.74	.76	.88	1.22	1.25	1.42	1.87
Sept. 9	.24	.29	.34	.42	.64	.69	.71	.72	.78	.80	.82	.84
Valentine												
June 19	.25	.38	.39	.44	.44	.44	.44	.44	.45	.46	.47	.47
Aug. 1	.29	.51	.67	.76	.98	1.11	1.69	2.06	2.30	2.30	2.63	2.65
Aug. 19	.22	.43	.55	.69	.95	1.21	1.39	1.50	1.57	1.59	1.64	1.67
Aug. 30	.41	.75	.88	.93	1.05	1.09	1.10	1.10	1.10	1.10	1.11	1.12
NEVADA												
Elko Airport						None						
Reno Airport						None						
Winnemucca Airport						None						
NEW HAMPSHIRE												
Concord Airport						None						
NEW JERSEY												
Atlantic City												
Mar. 30	.22	.34	.41	.42	.44	.49	.49	.50	.51	.54	.60	.78
May 23	.23	.33	.38	.41	.44	.47	.52	.59	.60	.62	.62	.65
July 17	.45	.74	.92	.97	.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Oct. 7	.25	.40	.49	.52	.55	.58	.62	.69	.71	.73	.75	.82
Nov. 1	.16	.26	.37	.43	.58	.82	.97	1.28	1.60	1.88	2.30	2.67
Newark Airport												
July 19	.17	.31	.43	.46	.50	.56	.59	.60	.60	.63	.64	.64
July 28	.35	.45	.52	.62	.79	.84	.88	.92	.99	1.03	1.09	1.19
Aug. 25	.45	.55	.55	.55	.55	.71	.73	.73	.73	.73	.73	.73
Oct. 7	.38	.68	.78	.82	.94	1.03	1.09	1.09	1.13	1.30	1.32	1.34
Oct. 24	.23	.33	.41	.45	.49	.54	.55	.56	.60	.63	.65	.66
Trenton												
May 11	.22	.32	.36	.38	.43	.47	.52	.56	.63	.69	.72	.72
July 17	.27	.45	.61	.76	.95	.99	1.00	1.00	1.00	1.00	1.00	1.00
Aug. 12	.31	.56	.69	.82	1.00	1.27	1.30	1.60	1.73	1.75	1.75	1.75
Aug. 21	.33	.55	.65	.76	1.00	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Oct. 7	.21	.30	.32	.36	.45	.49	.51	.52	.58	.59	.61	.64
Oct. 7	.19	.28	.42	.53	.69	.90	.96	.99	1.01	1.08	1.20	1.28
Oct. 24	.17	.31	.39	.47	.63	.68	.72	.75	.79	.83	.85	.86
Nov. 1	.18	.30	.39	.47	.60	.76	.85	.91	.95	1.09	1.22	1.34
Nov. 16	.24	.32	.38	.39	.40	.42	.46	.49	.51	.51	.52	.55
NEW MEXICO												
Albuquerque Airport						None						
Roswell Airport												
May 20	.15	.22	.28	.32	.53	.61	.67	.76	.77	.77	.77	.77
Aug. 22	.14	.25	.36	.48	.56	.57	.58	.70	.73	.74	.81	.84
NEW YORK												
Albany Airport												
May 27	.24	.42	.57	.68	.83	1.14	1.31	1.40	1.42	1.43	1.45	1.46
June 17	.18	.34	.38	.40	.47	.55	.57	.60	.60	.60	.60	.60
July 10	.27	.42	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45
Aug. 1	.52	.79	.85	.89	.90	.90	.92	.92	.92	.95	.95	.95
Aug. 3	.29	.47	.48	.50	.52	.53	.53	.54	.54	.54	.54	.54
Aug. 16	.43	.53	.56	.56	.61	.63	.66	.92	1.24	1.30	1.32	1.32
Aug. 21	.27	.27	.27	.28	.33	.33	.33	.38	.38	.38	.38	.38
Sept. 14	.13	.25	.34	.44	.59	.81	1.04	1.24	1.32	1.55	1.79	2.03
Oct. 24	.17	.29	.44	.57	.69	.78	.83	.86	.88	.91	.91	.91
Bear Mountain												
Mar. 30							1.07			1.62		2.00
June 29							.84			.87		.88
July 10							1.30			1.33		1.33
Aug. 16							.80			1.20		1.21
Oct. 7							.93			1.35		1.57
Nov. 16							1.19			1.26		1.30
Binghamton Airport												
Sept. 1	.22	.37	.45	.58	.63	.64	.64	.64	.64	.64	.64	.64

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
NEW YORK (Cont'd.)												
Buffalo Airport												
June 22	0.35	0.51	0.55	0.57	0.77	0.78	0.81	0.88	0.89	0.90	0.90	0.90
July 11	.27	.35	.36	.36	.36	.37	.37	.37	.37	.37	.47	.48
Aug. 31	.32	.44	.48	.48	.48	.48	.49	.60	.81	.82	.83	.83
New York Airport												
Oct. 7	.46	.81	1.09	1.18	1.23	1.39	1.47	1.51	1.55	1.59	1.63	1.65
New York												
May 23	.20	.31	.34	.36	.45	.52	.52	.52	.52	.52	.52	.52
July 19	.20	.35	.35	.35	.36	.36	.36	.36	.37	.37	.37	.37
July 19	.23	.32	.38	.46	.47	.51	.52	.52	.52	.52	.53	.53
July 28	.40	.49	.54	.54	.54	.54	.54	.54	1.05	1.19	1.28	1.28
July 28	.40	.50	.56	.63	.65	.70	.74	.74	.74	.74	.74	.75
July 28	.20	.37	.53	.62	.67	.71	.72	.79	.85	.89	1.28	1.39
July 28	.17	.35	.43	.43	.44	.48	.57	.58	.64	.72	.72	.72
Oct. 7	.33	.45	.71	.92	1.02	1.20	1.28	1.36	1.40	1.45	1.50	1.53
Oswego												
June 4	.22	.33	.47	.54	.58	.59	.78	.79	.79	.79	.79	.79
Aug. 31	.22	.33	.39	.52	.70	.76	.80	.83	.86	.88	.89	.91
Sept. 7	.31	.39	.56	.61	.64	.65	.65	.67	.69	.71	1.00	1.12
Rochester Airport												
July 19	.25	.36	.46	.52	.55	.70	.89	1.02	1.02	1.13	1.20	1.32
Syracuse Airport												
June 3	.25	.36	.41	.47	.51	.54	.54	.54	.54	.54	.54	.54
July 19	.48	.85	1.10	1.18	1.24	1.27	1.30	1.37	1.38	1.38	1.39	1.40
Aug. 16	.43	.78	.86	.90	.94	.97	.97	1.07	1.16	1.16	1.16	1.16
Sept. 14	.16	.25	.30	.37	.57	.68	.77	.93	.94	.94	.94	.94
Sept. 27	.17	.32	.34	.35	.35	.35	.35	.35	.35	.35	.35	.35
NORTH CAROLINA												
Asheville												
June 7	.21	.31	.32	.34	.37	.44	.49	.55	.58	.59	.59	.59
June 20	.59	.82	1.00	1.09	1.09	1.09	1.09	1.10	1.10	1.10	1.10	1.10
June 27	.25	.38	.44	.60	.65	.66	.66	.66	.66	.66	.66	.66
July 29	.15	.27	.35	.44	.53	.60	.68	.69	.70	.70	.70	.70
Sept. 2	.23	.38	.51	.58	.70	.82	.89	.91	.93	.94	.94	.98
Charlotte Airport												
Apr. 2	.21	.38	.49	.52	.54	.60	.64	.70	.77	.83	.86	.86
June 8	.34	.50	.62	.63	.63	.67	.71	.82	.86	.89	.93	.93
July 28	.15	.26	.48	.52	.55	.55	.56	.58	.59	.65	.75	.81
Aug. 9	.30	.50	.52	.53	.54	.55	.55	.55	.55	.55	.55	.55
Sept. 22	.16	.35	.50	.61	.74	.80	.84	1.04	1.30	1.40	1.60	1.70
Greensboro Airport												
June 8	.42	.64	.94	1.27	1.48	1.64	1.66	1.68	1.68	1.68	1.68	1.68
June 9	.21	.29	.35	.38	.45	.51	.53	.55	.73	.74	.76	.78
June 17	.20	.31	.46	.55	.78	1.14	1.32	1.48	1.61	1.67	1.69	1.80
July 4	.18	.33	.36	.37	.42	.49	.51	.52	.52	.52	.52	.52
July 4	.24	.30	.33	.34	.35	.37	.39	.42	.43	.45	.45	.45
Aug. 11	.29	.55	.76	.90	1.06	1.15	1.25	1.31	1.35	1.35	1.35	1.35
Aug. 14	.37	.72	1.03	1.23	1.56	1.85	2.08	2.35	2.44	2.47	2.47	2.47
Sept. 6	.22	.39	.48	.48	.50	.50	.50	.52	.52	.54	.55	.55
Hatteras												
Mar. 7	.20	.30	.34	.35	.37	.49	.54	.59	.62	.67	.77	.83
May 16	.21	.34	.42	.52	.66	.73	.84	.91	1.24	1.32	1.61	1.68
July 2	.21	.33	.41	.44	.71	.83	.86	.88	.89	.89	.89	.89
Aug. 2	.25	.37	.48	.55	.84	.98	.98	.99	1.00	1.04	1.05	1.27
Aug. 3–4	.22	.36	.39	.40	.40	.40	.43	.43	.43	.43	.46	.51
Aug. 12	.17	.28	.30	.33	.58	.63	.64	.66	.67	.67	.68	.68
Aug. 13	.21	.32	.34	.35	.35	.35	.35	.35	.35	.35	.44	.44
Sept. 4	.16	.26	.36	.42	.54	.66	.83	.83	.89	.96	1.00	1.00
Sept. 16–17	.22	.37	.47	.55	.64	.77	.83	.90	.93	.93	.93	.93
Sept. 23	.18	.30	.38	.38	.39	.39	.39	.39	.39	.39	.39	.39
Nov. 3	.28	.47	.61	.66	.73	.79	.84	.96	1.01	1.03	1.05	1.06
Nov. 7	.39	.60	.77	.96	1.11	1.26	1.85	2.20	2.47	2.67	2.86	2.89
Raleigh Airport												
*July 4	.23	.30	.32	.32	.35	.36	.37	.37	.37	.37	.62	.62
July 18	.40	.54	.69	.70	.70	.70	.70	.70	.70	.70	.70	.70
July 19	.30	.55	.60	.65	.69	.72	.72	.72	.72	.73	.73	.73
July 23	.33	.48	.56	.63	.70	.71	.71	.72	.73	.73	.73	.73
July 24	.25	.32	.38	.38	.38	.45	.70	.80	.88	.97	1.04	1.08
Aug. 3	Recording gage inoperative.											
Aug. 14	.25	.44	.54	.62	.70	.82	.86	.87	.89	.90	.99	1.00
Aug. 22	.26	.40	.62	.90	.96	.98	1.03	1.17	1.18	1.20	1.20	1.20
Oct. 7	.35	.45	.52	.52	.52	.52	.52	.52	.52	.52	.52	.52
Oct. 31	.35	.49	.51	.51	.51	.51	.51	.51	.51	.51	.51	.51
Raleigh												
Apr. 23	.26	.35	.43	.47	.51	.54	.56	.57	.57	.57	.57	.57
June 8	.14	.28	.35	.40	.42	.47	.50	.56	.59	.60	.60	.60
June 17	.28	.41	.43	.43	.43	.44	.44	.44	.44	.44	.44	.44
June 27	.30	.52	.68	.79	.86	.92	.94	.97	.99	.99	.99	.99
July 17	.33	.47	.53	.57	.58	.59	.60	.60	.62	.62	.62	.62
July 19	.30	.59	.81	1.03	1.35	1.80	2.48	2.96	3.38	3.57	3.75	3.87
Aug. 14	.44	.71	.91	1.10	1.35	1.56	1.60	1.60	1.61	1.63	1.66	1.66
Aug. 22	.27	.50	.61	.67	.80	.88	.91	.93	.98	.93	1.04	1.15
Wilmington City Office and Airport**												
Apr. 19	.29	.51	.71	.78	.97	1.03	1.51	1.65	1.74	1.78	1.83	2.00
Apr. 23	.20	.32	.39	.41	.44	.44	.44	.44	.44	.44	.44	.50
Apr. 30	.32	.52	.61	.63	.79	.79	.79	.79	.79	.79	.79	.79
May 5	.23	.39	.46	.50	.53	.55	.55	.55	.55	.55	.55	.61
June 9	.30	.42	.56	.60	.67	.67	.67	.67	.67	.67	.67	.67
June 27–28	.22	.36	.41	.43	.45	.45	.45	.45	.45	.45	.45	.45
July 16	.45	.83	1.15	1.48	2.08	2.97	3.10	3.11	3.12	3.15	3.15	3.15
July 20	.38	.72	.87	.93	.96	.96	.96	.96	.96	.96	.96	.96
July 25	.37	.54	.87	.99	1.01	1.01	1.38	1.44	1.66	1.66	1.67	1.68
Aug. 13	.89	1.60	2.09	2.21	2.38	2.63	2.63	2.63	2.63	2.63	2.67	2.70
Sept. 6	.25	.40	.44	.46	.50	.52	.54	.58	.61	.61	.61	.61
Nov. 6	.38	.61	.80	.96	1.36	1.55	1.73	1.98	2.61	2.84	3.22	3.54
Dec. 20	.28	.35	.42	.51	.57	.59	.59	.59	.59	.59	.61	.61

* Record of excessive precipitation at this station begun as of July 1, 1951.

** Station moved to the New Hanover County Airport on Oct. 2, 1951. Triple register out of service between Sept. 25th, and Oct. 2. The only rainfall during this period was 0.84 inches on Sept. 27th.

Table 8—Continued

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1951

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
NORTH DAKOTA												
Bismarck Airport												
July 16–17	0.18	0.33	0.48	0.61	0.88	1.05	1.35	1.38	1.40	1.40	1.40	1.40
Devils Lake												
July 29	.50	.85	1.20	1.29	1.42	1.43	1.43	1.44	1.45	1.45	1.45	1.45
Aug. 25	.28	.31	.31	.31	.31	.31	.31	.33	.34	.35	.35	.35
Fargo Airport												
June 10	.14	.25	.33	.42	.44	.45	.45	.45	.45	.45	.45	.45
July 3	.35	.54	.61	.64	.70	.80	.90	.99	1.10	1.15	1.23	1.30
July 24	.15	.27	.37	.40	.43	.43	.43	.43	.43	.43	.43	.43
July 26	.25	.45	.60	.70	.86	.99	1.00	1.01	1.01	1.01	1.01	1.01
Aug. 1	.50	.80	1.20	1.45	1.51	1.52	1.52	1.52	1.53	1.53	1.53	1.53
Aug. 28	.19	.34	.47	.50	.57	.61	.63	.65	.66	.66	.66	.66
Aug. 30	.17	.24	.41	.50	.60	.65	.69	.78	.95	.98	1.11	1.11
Williston												
July 16	.25	.35	.37	.38	.41	.44	.44	.44	.45	.45	.45	.45
OHIO												
Cincinnati												
June 8	.37	.44	.51	.59	.65	.72	.72	.72	.72	.72	.72	.72
July 10	.23	.30	.33	.34	.48	.52	.65	.68	.78	.83	.84	.84
Sept. 22	.25	.38	.41	.42	.45	.45	.45	.45	.45	.45	.45	.58
Oct. 23–24	.11	.21	.31	.42	.62	.70	.75	.79	.90	.99	1.05	1.09
Dec. 7	.50	.55	.56	.61	.68	.91	.96	1.05	1.07	1.07	1.09	1.09
Cleveland Airport												
July 4	.74	.96	.96	.96	.99	1.06	1.07	1.07	1.30	1.35	1.41	1.41
July 11	.55	1.00	1.15	1.19	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21
Aug. 31	.55	.90	1.20	1.35	1.62	1.65	1.67	1.77	1.79	1.86	2.89	2.89
Sept. 22	.76	1.00	1.43	1.57	1.80	2.03	2.07	2.07	2.07	2.07	2.07	2.45
Columbus												
June 22	.20	.33	.40	.42	.42	.42	.42	.42	.42	.42	.42	.42
June 27	.17	.32	.40	.41	.42	.44	.47	.48	.50	.52	.52	.52
Dec. 7	.25	.30	.34	.35	.37	.42	.43	.45	.47	.48	.49	.50
Dayton Airport												
Feb. 20	.12	.21	.28	.33	.50	.66	.72	.76	.82	.90	1.00	1.13
June 28	.40	.60	.68	.77	.90	.96	.98	1.00	1.00	1.00	1.30	1.35
Aug. 8 *	.28	.47	.55	.57	.66	.71	.71	.71	.71	.71	.71	.71
Dec. 7	.25	.34	.40	.45	.50	.53	.53	.53	.56	.57	.57	.57
Sandusky												
June 3	.26	.47	.60	.63	.63	.63	.63	.63	.63	.63	.63	.63
July 22	.58	.68	.78	.78	.88	.95	.95	.95	.95	.95	1.13	1.13
Toledo Airport						None						
Youngstown Airport												
June 3	.16	.26	.36	.49	.53	.53	.53	.53	.53	.53	.53	.53
July 12	.15	.27	.35	.51	.56	.57	.58	.58	.58	.58	.58	.58
July 19	.64	.76	.76	.76	.76	.76	.76	.76	.76	.76	.76	.76
July 27	.26	.37	.38	.38	.40	.41	.47	.54	.55	.57	.57	.57
July 27	.20	.32	.32	.33	.33	.33	.33	.33	.33	.33	.33	.33
Aug. 14	.28	.50	.50	.50	.52	.52	.52	.52	.58	.60	.60	.76
OKLAHOMA												
Oklahoma City												
Apr. 30			.45		.54	.59	.65	.66	.75	.92	1.07	1.22
May 19			.37		.57	.59	.62	.64	.67	.67	.67	.67
May 21–22			.52		.56	.57	.61	.64	.65	.65	.65	.65
May 27			.93		1.05	1.12	1.12	1.12	1.15	1.15	1.50	1.50
June 10			.90		1.49	1.64	1.68	1.74	1.80	1.82	1.82	1.82
June 11			.40		.56	.68	.77	.77	.86	.91	.92	.92
June 20			.41		.53	.53	.53	.53	.53	.53	.53	.53
July 4	.30	.41	.57	.58	.58	.58	.58	.58	.58	.58	.70	.70
Aug. 10	.30	.40	.43	.44	.45	.46	.47	.48	.51	.53	.55	.56
Sept. 7	.28	.32	.35	.38	.42	.45	.55	.55	.55	.61	.65	.67
Sept. 9	.43	.53	.68	.92	1.22	1.45	1.59	1.62	1.63	1.63	1.63	1.63
Tulsa Airport												
June 30	.73	1.04	1.22	1.25	1.31	1.50	1.63	1.68	1.71	1.74	1.96	2.15
July 14	.25	.43	.46	.46	.46	.46	.47	.47	.47	.47	.47	.47
Aug. 10	.60	.85	1.00	1.04	1.35	1.52	1.55	1.56	1.58	1.60	1.62	1.62
Sept. 9	.20	.25	.37	.45	.58	.60	.62	.62	.62	.62	.62	.62
Sept. 9	.35	.60	1.05	1.35	1.54	1.56	1.58	1.58	1.60	1.61	1.63	1.64
Sept. 12	.25	.45	.57	.62	.95	1.10	1.32	1.35	1.37	1.37	1.37	1.37
Oct. 5	.15	.28	.40	.55	.70	.71	.71	.71	.71	.71	.71	.71
Oct. 6	.35	.52	.55	.60	.88	1.04	1.15	1.70	1.76	1.82	2.10	2.31
Oct. 14	.30	.35	.37	.37	.37	.37	.37	.37	.37	.37	.37	.37
Oct. 27	.21	.34	.36	.41	.45	.53	.56	.57	.58	.59	.62	.86
OREGON												
Baker						None						
Eugene Airport						None						
Meacham Airport						None						
Portland						None						
Roseburg						None						
Sexton Summit						None						
PENNSYLVANIA												
Allentown Airport												
Apr. 12	.28	.42	.50	.55	.64	.71	.79	.88	.90	.95	.98	1.00
Apr. 29	.30	.35	.45	.48	.50	.53	.55	.55	.56	.57	.59	.59
May 23	.25	.46	.47	.48	.49	.50	.50	.50	.50	.50	.50	.50
June 22	.50	.75	1.00	1.10	1.30	1.38	1.90	1.98	2.04	2.10	2.13	2.14
June 30	.35	.40	.51	.51	.51	.51	.51	.51	.51	.51	.51	.51
July 19	.45	.75	.85	1.00	1.14	1.16	1.17	1.20	1.56	1.58	1.62	1.62
July 28	.20	.25	.35	.45	.60	.90	1.05	1.20	1.21	1.21	1.21	1.26
Aug. 15	.40	.63	1.03	1.13	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Aug. 16	.28	.56	.56	.56	.56	.56	.56	.56	.56	.56	.56	.56
Oct. 7	.45	.53	.69	.76	.96	1.07	1.09	1.17	1.18	1.19	1.24	1.39
PENNSYLVANIA (Cont'd.)												
Erie												
Apr. 29	0.27	0.44	0.51	0.53	0.54	0.54	0.55	0.55	0.55	0.55	0.55	0.55
June 1–2	.26	.40	.41	.42	.44	.48	.50	.50	.50	.58	.60	.61
June 29	.28	.46	.49	.49	.49	.49	.49	.49	.49	.49	.49	.49
July 4	.23	.46	.59	.65	.67	.68	.69	.72	.74	.75	.75	.78
Harrisburg Airport												
July 4	.15	.31	.38	.44	.44	.44	.44	.50	.54	.57	.61	.67
Aug. 19	.20	.23	.35	.41	.50	.59	.69	.78	.96	.96	.96	.96
Philadelphia												
May 11	.29	.41	.51	.54	.58	.62	.66	.71	.76	.83	.91	.93
May 29	.24	.44	.65	.75	.94	1.07	1.13	1.15	1.21	1.24	1.32	1.41
July 19	.55	.85	1.13	1.17	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Sept. 15	.11	.22	.27	.39	.50	.51	.52	.52	.55	.56	.59	.60
Oct. 7	.15	.21	.35	.44	.51	.55	.58	.65	.74	.83	.94	1.03
Oct. 7	.19	.33	.51	.60	.63	.65	.66	.72	.76	.80	.90	.92
Oct. 24	.28	.43	.58	.68	.74	.83	.85	.85	.88	.88	.89	.90
Pittsburgh Airport												
June 3	.20	.25	.48	.50	.50	.50	.50	.50	.50	.50	.50	.98
June 3	.34	.45	.53	.55	.55	.56	.57	.57	.61	.61	.64	.98
June 24	.43	.71	.75	.84	.99	1.80	1.87	2.32	2.34	2.34	2.34	2.34
June 27	.45	.55	.70	.70	.72	.75	.77	.77	.77	.86	1.05	1.35
June 28	.27	.32	.38	.39	.42	.62	.65	.65	.75	.75	.75	.94
July 10	.31	.57	.74	.80	.94	1.10	1.10	1.10	1.10	1.10	1.10	1.10
July 23	.25	.41	.46	.47	.49	.49	.52	.66	.73	.76	.76	.77
Reading												
Apr. 12	.17	.27	.36	.42	.54	.88	.99	1.07	1.13			1.60
May 11	.17	.30	.32	.34	.37	.39	.41	.41	.41	.41	.43	.44
June 3	.29	.56	.71	.79	.81	.81	.82	.84	.85	.87	.89	.91
June 22	.28	.32	.39	.42	.47	.50	.55	.61	.61	.61	.61	.61
July 12	.44	.72	.82	.91	1.04	1.12	1.19	1.20	1.21	1.21	1.21	1.21
July 17	.24	.36	.48	.57	.63	.64	.64	.64	.64	.64	.64	.68
July 19	.30	.52	.58	.61	.64	.73	.92	.98	.98	.99	.99	.99
Sept. 2	.22	.41	.50	.54	.60	.63	.67	.72	.73	.73	.73	.73
Sept. 2	.23	.35	.42	.50	.60	.65	.69	.76	.79	.79	.79	.80
Oct. 7	.15	.28	.35	.45	.62	.71	.76	.79	.80	.82	.91	.97
Scranton												
June 22	.38	.55	.67	.78	.94	1.24	1.41	1.52	1.55	1.56	1.56	1.56
July 4	.32	.53	.78	.98	1.31	1.38	1.43	1.47	1.47	1.47	1.47	1.48
July 10	.18	.29	.37	.41	.44	.48	.48	.48	.48	.48	.48	.48
July 12	.44	.66	.72	.77	.79	.83	.86	.87	.87	.90	.91	.92
July 27	.30	.42	.53	.75	.92	.97	.98	.99	.99	1.01	1.05	1.07
Aug. 16	.29	.58	.59	.59	.59	.59	.59	.59	.59	.60	.63	.63
Oct. 7	.22	.42	.54	.60	.66	.71	.75	.79	.83	.88	.95	1.06
RHODE ISLAND												
Providence Airport												
June 17	.38	.66	.91	1.09	1.20	1.22	1.22	1.24	1.25	1.25	1.25	1.27
SOUTH CAROLINA												
Charleston												
Apr. 23	.13	.24	.34	.40	.45	.60	.63	.65	.65	.65	.65	.65
May 4	.31	.38	.38	.41	.42	.43	.43	.45	.52	.55	.55	.55
June 5	.28	.40	.42	.42	.42	.42	.43	.46	.50	.53	.57	.58
June 8	.27	.40	.49	.54	.58	.58	.59	.63	.68	.69	.70	.70
June 9	.40	.57	.70	.79	.88	.91	.92	.93	.93	.93	.93	.93
June 9	.38	.48	.58	.60	.62	.62	.62	.62	.62	.62	.62	.62
June 18	.28	.42	.43	.45	.59	.82	.97	1.00	1.07	1.11	1.12	1.12
July 24	.27	.47	.63	.70	.75	.77	.78	.79	.79	.80	.81	.81
July 26	.46	.70	.93	1.15	1.34	1.37	1.50	1.67	1.71	1.75	1.79	1.83
July 30	.56	.68	.73	.75	.84	.92	.95	.97	1.00	1.05	1.15	1.19
Aug. 4	.25	.42	.54	.74	1.05	1.21	1.34	1.38	1.38	1.39	1.39	1.39
Aug. 23	.50	.79	1.14	1.24	1.25	1.25	1.25	1.25	1.25	1.25	1.27	1.30
Sept. 6	.40	.65	.90	1.10	1.57	2.10	2.63	2.93	2.97	2.97	2.97	2.97
Sept. 14	.19	.30	.33	.37	.50	.51	.52	.53	.53	.53	.53	.53
*Sept. 23	.22	.31	.41	.51	.66	.72	.76	.78	.80	.81	.81	.81
Columbia												
Apr. 2	.17	.28	.40	.44	.48	.52	.56	.61	.66	.66	.66	.66
June 4	.28	.39	.57	.69	.73	.73	.74	.74	.74	.74	.74	.74
June 9	.28	.39	.46	.48	.48	.49	.50	.50	.50	.50	.50	.50
June 17	.21	.35	.46	.59	.64	.78	1.12	1.17	1.17	1.17	1.17	1.17
July 16	.19	.32	.40	.41	.41	.43	.44	.51	.76	.80	.81	.88
July 25	.17	.27	.36	.39	.46	.57	.57	.58	.58	.58	.59	.59
July 28	.24	.40	.53	.62	.70	.80	.91	1.10	1.14	1.16	1.16	1.16
Aug. 16	.21	.35	.37	.38	.39	.39	.40	.42	.47	.47	.48	.48
Sept. 2	.21	.35	.41	.44	.48	.51	.51	.51	.51	.51	.51	.51
Sept. 6	.24	.38	.43	.45	.48	.49	.49	.49	.49	.49	.49	.49
Greenville Airport												
Apr. 2	.26	.35	.40	.54	.64	.71	.71	.78	.86	.91	.93	.93
June 5	.32	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35
July 15	.51	.83	1.12	1.23	1.32	1.39	1.40	1.44	1.44	1.44	1.44	1.44
July 28	.37	.58	.83	.98	1.13	1.14	1.14	1.14	1.16	1.16	1.16	1.16
Aug. 10	.40	.62	.79	.90	1.07	1.17	1.19	1.19	1.19	1.19	1.19	1.22
Aug. 13	.56	.97	1.42	1.67	2.17	2.62	3.06	3.44	3.72	3.73	3.75	3.80
Aug. 22	.22	.37	.42	.55	.58	.59	.59	.59	.59	.59	.59	.59
Sept. 6	.44	.77	1.02	1.36	1.84	2.77	3.63	4.25	4.49	4.49	5.03	5.29
Sept. 6	.28	.40	.41	.42	.42	.42	.42	.42	.42	.62	.80	1.01
Sept. 22	.32	.55	.68	.75	.79	.83	1.02	1.08	1.12	1.15	1.21	1.23
SOUTH DAKOTA												
Rapid City Airport												
Aug. 11–12	.30	.47	.53	.65	.67	.69	.70	.71	.72	.72	.72	.72
Aug. 24	.28	.36	.44	.44	.44	.44	.44	.44	.44	.44	.44	.44
Aug. 31	.15	.32	.37	.39	.40	.41	.41	.42	.43	.51	.52	.52
Huron												
June 27	.44	.68	.81	.84	.87	.87	.87	.93	.95	1.26	1.35	1.60
Aug. 15	.31	.52	.65	.75	.86	1.06	1.25	1.57	1.61	1.66	1.74	1.79
TENNESSEE												
Chattanooga Airport												
May 2	.29	.48	.64	.70	.79	.79	.79	.79	.79	.79	.79	.79
Aug. 10	.26	.39	.44	.48	.53	.61	.66	.66	.70	.74	.74	.74

	5	10	15	20	30	45	60	80	100	120	150	180
*July 8	.30	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33

* Data estimated.

Table 8—Continued

EXCESSIVE SHORT DURATION RAINFALL

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
TENNESSEE (Cont'd.)												
Chattanooga Airport (Cont'd.)												
Aug. 30	0.25	0.29	0.29	0.29	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Sept. 6	.21	.32	.48	.61	.66	.88	.93	.95	.99	1.00	1.00	1.00
Sept. 13	.16	.30	.39	.50	.66	.78	.85	.88	.91	.93	.94	.95
Sept. 24	.35	.62	.71	.75	.84	.89	.93	.94	.96	.96	.97	.97
Nov. 16	.32	.40	.52	.52	.53	.54	.55	.56	.59	.60	.61	.62
Knoxville Airport												
June 4	.32	.58	.79	1.00	1.22	1.25	1.25	1.25	1.25	1.25	1.25	1.25
June 7	.25	.45	.55	.57	.62	.64	.66	.70	.74	.77	.85	.86
June 12	.27	.32	.35	.38	.42	.51	.57	.65	.66	.70	.74	.77
June 29	.23	.37	.45	.55	.67	.72	.73	.74	.74	.74	.74	.74
July 27	.22	.31	.32	.36	.40	.44	.50	.61	.65	.65	.65	.65
Sept. 6	.33	.39	.43	.45	.47	.54	.57	.60	.62	.62	.63	.63
Sept. 24	.22	.34	.38	.40	.42	.47	.53	.56	.64	.70	.75	.79
Nov. 1	.16	.23	.31	.41	.51	.64	.80	1.02	1.28	1.35	1.54	1.61
Nov. 14	.25	.29	.29	.29	.30	.35	.36	.40	.42	.51	.63	.65
Memphis Airport												
Jan. 2	.34	.49	.64	.71	.85	1.12	1.38	1.53	1.71	1.81	1.91	1.98
Jan. 13	.22	.34	.44	.49	.53	.56	.63	.70	.75	.78	.85	.92
Jan. 14	.13	.25	.31	.37	.56	.77	.86	.99	1.07	1.08	1.22	1.35
Mar. 17	.32	.56	.77	.89	1.11	1.20	1.20	1.20	1.20	1.26	1.27	1.27
May 22-23	.36	.56	.60	.62	.65	.89	.99	1.09	1.09	1.10	1.10	1.75
June 3	.19	.37	.45	.45	.46	.46	.48	.48	.48	.48	.50	.50
June 9	.34	.51	.55	.57	.71	.91	.97	1.05	1.10	1.11	1.12	1.12
June 20	.38	.58	.64	.68	.71	.80	.85	.86	.87	.88	.89	.89
June 29	.36	.53	.60	.64	.67	.71	.72	.74	.75	.76	.77	.77
June 30	.33	.46	.49	.55	.59	.64	.68	1.04	1.26	1.28	1.30	1.36
July 3	.27	.41	.54	.64	.69	.71	1.04	1.15	1.22	1.25	1.29	1.34
July 14	.28	.56	.74	.92	1.13	1.23	1.25	1.26	1.26	1.26	1.26	1.26
July 26	.33	.61	.72	.77	.80	.81	.81	.81	.81	.81	.82	.82
Aug. 10	.23	.35	.38	.40	.47	.50	.51	.52	.53	.54	.59	.68
Aug. 18	.25	.31	.41	.45	.74	.81	.81	.83	.84	.86	.98	1.06
Sept. 10	.22	.32	.40	.42	.42	.45	.45	.46	.46	.47	.54	.60
Sept. 13	.17	.28	.37	.42	.51	.76	.82	.95	1.03	1.09	1.14	1.14
Sept. 21	.20	.32	.39	.43	.46	.47	.48	.49	.49	.50	.51	.52
Nashville Airport												
June 22	.73	.80	.83	.86	.90	.92	.93	.97	.98	.98	.98	.98
July 23	.35	.55	.78	1.05	1.55	2.15	2.21	2.29	2.29	2.29	2.29	2.29
Nov. 13	.28	.30	.31	.31	.31	.34	.42	.48	.51	.66	.69	.70
Dec. 7	.55	.74	.87	1.10	1.33	1.56	1.60	1.61	1.64	1.65	1.65	1.66
TEXAS												
Abilene Airport												
May 21	.30	.41	.42	.42	.42	.42	.42	.42	.42	.44	.53	.58
May 24	.27	.48	.61	.78	.96	1.03	1.05	1.06	1.06	1.06	1.06	1.06
June 10			.77	.83	1.05	1.18	1.21	1.35	1.40	1.42	1.42	1.42
July 2			.40	.65	.73	.95	1.15	1.25	1.32	1.36	1.37	1.46
Sept. 15	.15	.30	.38	.48	.52	.52	.52	.52	.52	.52	.52	.52
Amarillo Airport												
May 15	.32	.52	.60	.63	.66	.73	.79	.93	1.01	1.08	1.17	1.23
May 15	.32	.51	.67	.75	.81	.93	.97	1.02	1.08	1.11	1.21	1.24
May 16	.42	.69	.82	.92	1.03	1.19	1.34	1.48	1.61	1.67	1.80	1.90
May 27	.13	.26	.36	.43	.49	.55	.58	.59	.59	.59	.59	.61
June 11	.68	1.03	1.56	1.84	2.00	2.02	2.03	2.03	2.03	2.03	2.03	2.03
June 14	.25	.48	.60	.72	.82	.84	.86	.88	.89	.90	.90	.90
June 15	.19	.29	.35	.44	.53	.57	.63	.69	.73	.76	.76	.76
July 1	.23	.45	.53	.57	.69	.75	.77	.77	.77	.77	.77	.77
Sept. 7	.35	.63	.80	.98	1.01	1.03	1.06	1.20	1.35	1.38	1.45	1.52
Oct. 5	.61	1.05	1.21	1.23	1.25	1.26	1.26	1.27	1.28	1.29	1.29	1.29
Austin Airport												
Mar. 27	.39	.48	.54	.63	.69	.91	1.06	1.27	1.53	1.79	2.01	2.24
May 23	.35	.62	.82	.89	.93	.93	.93	.93	.94	.94	.94	.94
May 24	.45	.69	.81	.87	.89	.90	.91	.91	.93	.94	.98	1.00
June 3	.34	.69	.90	1.04	1.30	1.48	1.58	1.66	1.82	1.99	2.35	2.88
June 12	.56	.98	1.35	1.66	2.06	2.14	2.16	2.17	2.17	2.18	2.21	2.31
Aug. 19	.36	.59	.77	.94	1.30	1.51	1.55	1.68	1.73	1.86	1.89	1.91
Sept. 8	.32	.56	.70	.82	.98	1.08	1.18	1.22	1.23	1.25	1.25	1.25
Sept. 13	.25	.44	.60	.69	.90	1.13	1.36	1.50	1.54	1.66	1.80	1.84
Sept. 24	.38	.60	.70	.71	.72	.72	.74	.76	.77	.77	.77	.77
Brownsville Airport												
Feb. 13-14	.17	.28	.35	.41	.50	.65	.80	.82	.85	.88	.94	.96
May 11	.42	.79	1.01	1.17	1.33	1.43	1.45	1.46	1.47	1.49	1.49	1.49
*Aug. 2	.35	.60	.80	.95	1.10	1.25	1.35	1.43	1.46	1.50	1.54	1.57
Aug. 22	.40	.75	.90	1.04	1.49	1.90	2.31	2.61	2.79	3.34	3.52	3.91
Sept. 14	.31	.41	.49	.51	.52	.52	.52	.52	.52	.52	.52	.52
Sept. 15	.23	.46	.63	.69	.80	.89	.95	1.14	1.26	1.33	1.42	1.51
Sept. 29	.33	.39	.40	.40	.40	.40	.56	.56	.56	.56	.56	.56
Sept. 29-30	.18	.25	.38	.41	.43	.57	.70	.71	.73	.75	.75	.75
Oct. 18	.39	.62	.68	.79	.89	.96	1.00	1.00	1.00	1.00	1.00	1.00
Oct. 19	.23	.43	.55	.59	.62	.63	.63	.64	.64	.66	.68	.68
Oct. 23	.20	.37	.47	.51	.56	.58	.58	.63	.63	.63	.68	.70
Corpus Christi Airport												
June 3	.32	.60	.85	1.12	1.30	1.47	1.53	1.57	1.60	1.60	1.60	1.60
June 4	.28	.57	.83	1.02	1.33	1.46	1.72	1.78	1.92	2.07	2.09	2.13
Sept. 13	.22	.36	.38	.41	.50	.62	.81	.95	1.05	1.38	1.55	1.62
Sept. 13	.32	.54	.60	.62	.66	.68	.70	.73	.74	.81	.86	.94
Sept. 14	.17	.29	.44	.53	.62	.70	.80	.97	1.02	1.20	1.22	1.27
Sept. 15	.24	.34	.46	.58	.67	.87	.96	1.11	1.24	1.31	1.37	1.40
Sept. 22	.33	.65	.95	1.17	1.61	1.84	2.06	2.28	2.40	2.40	2.41	2.41
Sept. 23	.29	.40	.45	.47	.47	.47	.47	.47	.50	.52	.65	.65
Sept. 25	.29	.48	.52	.53	.55	.72	.87	1.16	1.28	1.31	1.37	1.42
Dallas Airport												
Feb. 20	.14	.21	.32	.42	.47	.50	.52	.53	.54	.56	.56	.56
May 22	.19	.35	.46	.56	.74	.87	.95	.99	1.05	1.11	1.16	1.16
June 2	.38	.63	.73	.85	.97	1.43	1.76	1.82	2.21	2.39	2.42	2.71
June 12	.34	.59	.71	.74	.75	.76	.76	.76	.76	.76	.76	.76
June 15	.25	.34	.47	.50	.56	.57	.58	.60	.60	.60	.60	.60
Aug. 22	.34	.54	.77	.94	1.17	1.34	1.36	1.37	1.38	1.41	1.47	1.53
Sept. 10	.20	.35	.45	.53	.65	.68	.75	.77	.78	.79	.79	.79
Sept. 12	.36	.70	.93	1.02	1.19	1.60	2.05	2.16	2.46	2.46	2.46	2.46
Del Rio Airport						None						
El Paso Airport						None						
TEXAS (Cont'd.)												
Fort Worth Airport												
Apr. 20	0.10	0.20	0.35	0.40	0.45	0.51	0.56	0.62	0.66	0.67	0.67	0.67
Apr. 25	.25	.37	.50	.53	.64	.64	.64	.64	.64	.64	.64	.64
Apr. 30-May 1	.25	.37	.45	.50	.62	.65	.66	.67	.67	.67	.67	.67
May 5	.28	.45	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
May 9	.30	.38	.50	.53	.85	1.04	1.07	1.07	1.08	1.08	1.08	1.08
May 21-22	.15	.28	.40	.45	.68	.90	.95	1.00	1.08	1.13	1.22	1.31
June 16	.15	.30	.33	.35	.37	.45	.62	.66	.70	.76	.78	.78
July 2	.20	.35	.46	.55	.77	1.02	1.14	1.42	1.62	1.65	1.65	1.65
Oct. 22	.22	.30	.39	.43	.50	.54	.57	.63	.63	.63	.63	.63
Galveston												
Jan. 6	.25	.42	.48	.49	.50	.52	.55	.61	.67	.75	.77	.77
Jan. 29	.21	.31	.46	.57	.71	.86	.94	.98	.98	.99	1.01	1.11
Mar. 27	.43	.64	.86	.96	1.02	1.11	1.13	1.13	1.14	1.14	1.15	1.16
May 25	.38	.65	.87	1.00	1.04	1.04	1.06	1.07	1.08	1.08	1.09	1.09
June 24	.29	.58	.76	.77	.77	.77	.77	.77	.77	.77	.77	.77
July 16	.20	.33	.33	.33	.33	.33	.33	.34	.34	.34	.34	.34
July 29	.33	.59	.83	.93	1.34	1.93	2.18	2.34	2.36	2.37	2.37	2.37
July 31	.29	.49	.60	.66	.73	.78	.87	.90	.90	.90	.90	.90
Sept. 2	.28	.50	.70	.84	1.07	1.13	1.16	1.18	1.18	1.18	1.18	1.18
Sept. 7	.25	.35	.50	.61	.80	.91	.99	1.29	1.42	1.66	2.05	2.20
Sept. 12	.21	.36	.40	.41	.41	.44	.45	.46	.46	.88	.98	1.02
Sept. 13	.16	.32	.36	.47	.60	.71	.82	.90	1.00	1.09	1.15	1.20
Sept. 25	.26	.44	.54	.61	.76	.78	1.08	1.11	1.22	1.25	1.25	1.26
Oct. 23	.17	.19	.37	.43	.46	.51	.55	.63	.66	.67	.68	.68
Oct. 29	.18	.39	.50	.55	.67	.71	.73	.73	.74	.74	.74	.74
Dec. 3	.25	.42	.48	.50	.52	.53	.54	.54	.54	.54	.54	.54
Houston												
June 13	.23	.31	.33	.34	.34	.34	.34	.34	.34	.34	.34	.34
July 23	.21	.40	.52	.55	.61	.64	.64	.64	.64	.64	.64	.64
July 26	.42	.72	1.07	1.37	1.87	2.26	2.31	2.35	2.35	2.35	2.35	2.35
Sept. 12	.14	.22	.33	.40	.44	.48	.53	.57	.61	.62	.63	.64
Oct. 23	.28	.34	.37	.42	.46	.51	.55	.60	.66	.69	.70	.71
Nov. 5	.50	.66	.71	.74	.83	.89	.91	.91	.91	.91	.91	.91
Port Arthur												
Mar. 21	.20	.31	.35	.38	.45	.51	.56	.60	.64	.67	.70	.71
Mar. 27	.55	.79	.85	.90	1.20	1.75	2.24	2.74	2.94	3.03	3.06	3.20
June 12	.42	.62	.70	.73	.77	.81	.83	.92	.93	.93	.94	.94
July 19	.22	.36	.44	.50	.52	.53	.53	.53	.53	.53	.53	.53
July 24	.24	.35	.39	.45	.49	.50	.50	.52	.52	.53	.53	.53
July 25	.27	.37	.50	.70	.95	1.09	1.09	1.12	1.13	1.13	1.13	1.26
July 26	.32	.60	.79	.91	1.05	1.06	1.07	1.07	1.07	1.07	1.07	1.07
July 31	.61	1.05	1.42	1.72	2.20	2.52	2.54	2.54	2.54	2.54	2.54	2.54
July 31	.24	.39	.49	.59	.64	.64	.65	.65	.65	.65	.65	.65
Sept. 14	.29	.51	.71	.87	1.08	1.27	1.35	1.49	1.57	1.66	1.82	1.86
Sept. 21	.28	.46	.59	.66	.73	.82	.88	.88	.88	.88	.88	.93
Sept. 21	.28	.28	.29	.29	.29	.31	.32	.33	.33	.34	.35	.35
Sept. 21	.30	.48	.54	.64	.71	.79	.90	1.10	1.30	1.37	1.49	1.64
Sept. 25	.30	.48	.68	.81	.87	.88	.88	.88	.88	.89	.89	.89
Nov. 1	.20	.35	.43	.50	.69	.74	.74	.75	.79	.88	.95	1.08
Dec. 3	.25	.38	.57	.60	.65	.65	.65	.65	.66	.66	.66	.69
Dec. 14	.18	.31	.42	.54	.74	.86	.97	1.15	1.22	1.23	1.23	1.23
San Antonio Airport												
Mar. 28	.27	.39	.47	.53	.55	.56	.56	.56	.56	.56	.56	.56
May 15	.23	.35	.43	.49	.54	.55	.55	.56	.57	.57	.59	.61
May 25	.27	.42	.57	.71	.90	1.05	1.18	1.21	1.24	1.24	1.24	1.24
June 3	.39	.78	1.10	1.38	1.98	2.50	2.95	4.18	4.68	5.02	5.20	5.77
Sept. 13	.25	.41	.50	.56	.84	1.15	1.32	1.39	1.41	1.44	1.51	1.69
UTAH												
Milford						None						
Salt Lake City												
Aug. 4	.30	.50	.70	.85	1.00	1.06	1.08	1.11	1.13	1.13	1.13	1.13
VERMONT												
Burlington Airport						None						
VIRGINIA												
Cape Henry												
May 11	.20	.36	.39	.42	.50	.64	.80	.99	1.11	1.19	1.28	1.38
June 13	.24	.34	.42	.46	.49	.50	.51	.51	.52	.52	.55	.59
June 28	.55	1.08	1.43	1.67	1.93	2.43	3.17	3.21	3.21	3.21	3.22	3.22
July 19	.19	.34	.44	.53	.63	.69	.73	.76	.76	.76	.76	.76
Aug. 1	.30	.46	.48	.49	.50	.51	.51	.51	.52	.52	.52	.52
Aug. 3	.55	.88	1.15	1.23	1.24	1.25	1.42	1.86	1.99	2.02	2.03	2.77
Lynchburg Airport												
Apr. 29	.27	.31	.34	.40	.40	.48	.48	.48	.48	.48	.49	.49
June 3	.26	.51	.74	.88	.99	1.35	1.57	1.64	1.66	1.71	1.81	1.91
June 8	.29	.43	.48	.49	.50	.54	.55	.55	.55	.55	.55	.55
June 13	.22	.28	.36	.45	.55	.57	.57	.59	.60	.60	.60	.71
June 27	.33	.51	.62	.77	.90	.91	.92	.92	.92	.92	.92	.92
Sept. 6	.25	.37	.44	.46	.54	.60	.63	.64	.64	.65	.67	.67
Sept. 13	.32	.36	.38	.38	.38	.39	.39	.39	.39	.39	.39	.39
Nov. 1	.13	.24	.28	.34	.44	.58	.71	.97	1.20	1.43	1.53	1.75
Norfolk												
Jan. 7	.28	.34	.38	.43	.45	.48	.49	.52	.52	.53	.53	.53
May 3	.20	.27	.33	.38	.58	.79	.83	.83	.84	.84	.84	1.11
May 11	.21	.29	.34	.42	.46	.54	.73	.74	.75	.76	.86	.87
June 13	.24	.34	.38	.41	.42	.42	.42	.43	.43	.44	.46	.48
June 24	.23	.33	.34	.38	.64	.64	.85	1.00	1.28	1.34	1.34	1.34
June 27	.35	.46	.47	.48	.51	.52	.53	.54	.54	.54	.54	.54
July 4	.43	.51	.56	.59	.61	.72	.73	.74	.74	.74	.74	.74
July 19	.41	.60	.69	.78	.86	.91	.93	.95	.95	.95	.95	.95
Aug. 1	.19	.28	.36	.40	.42	.43	.43	.43	.44	.44	.44	.44
Aug. 3	.35	.56	.79	1.05	1.43	1.53	1.56	1.62	1.64	1.65	1.68	1.70
Aug. 10	.14	.26	.30	.35	.50	.68	.74	.86	.93	.94	1.02	1.05
Aug. 22	.23	.41	.59	.66	.78	.90	1.02	1.04	1.06	1.07	1.21	1.24
Aug. 11	.21	.24	.35	.44	.48	.67	.81	.82	.84	.84	.84	.84
Aug. 28	.15	.26	.39	.48	.64	.70	.71	.71	.72	.73	.75	.75
Oct. 4	.19	.33	.44	.50	.58	.63	.69	.73	.75	.76	.77	.83
Nov. 3	.23	.40	.58	.76	.93	1.23	1.41	1.50	1.51	1.55	1.63	1.64
Richmond												
Mar. 7	.30	.40	.45	.50	.52	.54	.54	.54	.54	.54	.54	.54
May 3	.50	.51	.51	.51	.51	.51	.51	.51	.51	.51	.51	.51

* Estimated due to missing triple register record.

Table 8—Continued

EXCESSIVE SHORT DURATION RAINFALL

YEAR 1951

Station and date	Maximum precipitation in inches (5 to 180 minutes)											
	5	10	15	20	30	45	60	80	100	120	150	180
VIRGINIA (Cont'd.)												
Richmond (Cont'd.)												
May 11	0.22	0.32	0.34	0.35	0.35	0.35	0.35	0.35	0.35	0.50	0.67	0.67
May 23	.39	.44	.46	.49	.49	.51	.51	.51	.65	.80	.92	.97
June 13	.25	.30	.51	.61	.75	.98	.99	1.10	1.27	1.35	1.37	1.38
July 16	.30	.51	.67	.71	1.00	1.24	1.34	1.35	1.35	1.35	1.35	1.35
July 26	.45	.65	.82	.85	.88	.88	.88	.88	.88	.88	.88	.88
Aug. 10	.29	.56	.61	.62	.65	.98	1.20	1.28	1.29	1.29	1.29	1.29
Aug. 12	.50	.70	.76	.85	.90	.90	1.02	1.04	1.04	1.07	1.10	1.10
Sept. 2	.25	.32	.55	.60	.65	.66	.66	.66	.71	.73	.74	.77
Oct. 7	.30	.57	.68	.77	.84	.88	.93	.97	1.00	1.09	1.22	1.28
WASHINGTON												
North Head												
Oct. 24	.24	.35	.45	.50	.57	.70	.79	.86	.98	1.07	1.15	1.30
Spokane Airport						None						
Tatoosh Island						None						
Walla Walla						None						
Yakima Airport						None						
WEST VIRGINIA												
Elkins Airport												
June 22	.27	.34	.34	.34	.35	.37	.38	.39	.40	.52	.53	.53
June 23	.20	.31	.38	.45	.51	.55	.56	.57	.58	.58	.58	.58
July 29	.32	.55	.59	.67	.67	.67	.67	.67	.67	.67	.67	.67
Huntington												
Aug. 27-28	.20	.30	.39	.48	.60	.67	.76	.82	.89	.93	1.08	1.22
Parkersburg												
July 12	.26	.37	.37	.38	.38	.38	.38	.40	.41	.41	.41	.41
July 24	.15	.24	.41	.54	.61	.75	.75	.75	.75	.86	.92	.93
Sept. 13	.19	.34	.39	.48	.54	.60	.67	.95	1.01	1.10	1.21	1.45
WISCONSIN												
Green Bay Airport												
July 3	.16	.28	.37	.44	.52	.53	.60	.67	.67	.67	.67	.67
July 27	.28	.43	.61	.62	.63	.65	.65	.65	.65	.65	.65	.65
Aug. 17	.34	.58	.78	.94	1.24	1.42	1.50	1.55	1.59	1.59	1.59	1.59
Aug. 30	.50	.65	.69	.70	.70	.70	.70	.70	.71	.72	.72	.75
Sept. 12	.41	.53	.55	.57	.65	.68	.71	.76	.79	.81	.83	.85
Sept. 26	.38	.60	.73	.74	.76	.79	.83	.88	.94	.94	.94	.95
Oct. 4	.23	.38	.46	.49	.50	.65	.65	.65	.65	.65	.66	.67
La Crosse Airport												
June 25	.28	.43	.50	.56	.58	.62	.66	.67	.70	.80	.83	.83
June 27	.25	.50	.58	.64	.67	.68	.71	.72	.72	.72	.72	.72
July 21	.14	.24	.40	.44	.53	.57	.62	.69	.82	.84	1.14	2.04
Sept. 9	.30	.34	.42	.53	.71	.76	.82	.82	.82	.82	.86	.86
Oct. 2	.29	.56	.66	.69	.77	.84	.95	.97	1.12	1.18	1.20	1.30
Madison												
Sept. 12	.25	.45	.56	.59	.63	.72	.84	.89	1.00	1.03	1.14	1.17
Milwaukee Airport												
Apr. 28-29	.30	.40	.44	.56	.60	.61	.84	.89	.91	.96	1.06	1.15
June 1	.28	.37	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43
June 1	.24	.31	.33	.33	.34	.34	.34	.34	.50	.60	.64	.71
June 19	.32	.51	.52	.52	.52	.52	.52	.52	.52	.52	.52	.52
July 8	.32	.49	.55	.64	.74	.79	.82	.88	.93	1.02	1.04	1.04
July 18	.22	.38	.45	.46	.48	.48	.48	.48	.48	.48	.48	.48
Sept. 12	.44	.65	.86	1.03	1.19	1.20	1.33	1.35	1.39	1.41	1.42	1.42
WYOMING												
Cheyenne Airport												
May 15	.27	.51	.65	.69	.70	.70	.71	.74	.74	.74	.76	.77
Sept. 6	.29	.43	.49	.50	.50	.50	.50	.50	.50	.50	.50	.50
Lander Airport						None						
Rock Springs Airport						None						
Sheridan Airport						None						
ALASKA												
Annette Airport						None						
Fairbanks Airport						None						
Juneau Airport						None						
PUERTO RICO												
San Juan Airport												
Jan. 8	.30	.38	.42	.46	.57	.67	.70	.89	.97	1.25	1.25	1.25
May 1	.39	.68	.90	1.08	1.41	1.65	1.65	1.65	1.65	1.65	1.65	1.65
May 3	.19	.33	.40	.48	.55	.57	.57	.57	.57	.57	.57	.57
May 14	.30	.47	.64	.80	.86	.92	.94	.94	.94	.94	.94	.94
May 26	.30	.46	.47	.47	.47	.47	.47	.47	.47	.47	.47	.47
May 29	.20	.30	.30	.42	.45	.65	.80	.88	1.02	1.07	1.08	1.08
June 9	.37	.52	.79	1.04	1.22	1.26	1.29	1.53	1.60	1.60	1.60	1.62
June 27	.20	.28	.35	.51	.65	.92	.92	.97	1.00	1.01	1.01	1.07
July 6	.25	.41	.51	.58	.61	.61	.61	.61	.61	.61	.61	.61
July 10	.29	.49	.62	.66	.70	.85	.87	.89	.89	.89	.89	.89
July 14	.15	.25	.33	.42	.47	.60	.71	.71	.71	.71	.71	.71
July 30	.26	.42	.45	.47	.51	.55	.55	.55	.55	.76	.82	.85
Aug. 6	.16	.25	.32	.43	.52	.54	.54	.54	.54	.54	.54	.54
Aug. 8	.22	.29	.35	.40	.42	.42	.42	.42	.42	.42	.42	.42
Aug. 15	.30	.50	.71	.76	1.02	1.09	1.09	1.09	1.13	1.13	1.13	1.13
Aug. 16	.22	.37	.43	.50	.60	.64	.64	.66	.76	.85	.87	.87
Sept. 12	.23	.30	.36	.43	.61	.63	.63	.63	.63	.63	.63	.63
Sept. 15	.35	.59	.74	.75	.75	.75	.75	.75	.75	.75	.75	.75
Sept. 20	.33	.39	.42	.42	.42	.42	.42	.42	.42	.42	.42	.42
Sept. 22	.31	.48	.55	.57	.59	.67	.88	.91	.92	.95	.98	.99
Sept. 24	.29	.50	.56	.61	.66	.71	.91	.91	.91	.91	.91	1.04
Sept. 26	.35	.40	.44	.56	.57	.57	.57	.57	.57	.57	.57	.57
Oct. 1	.28	.49	.59	.65	.77	1.24	1.27	1.27	1.27	1.28	1.28	1.28
PUERTO RICO (Cont'd.)												
San Juan Airport (Cont'd.)												
Oct. 15	0.19	0.33	0.46	0.56	0.74	1.07	1.27	1.33	1.33	1.33	1.33	1.33
Oct. 24	.27	.44	.50	.52	.52	.52	.52	.52	.52	.52	.52	.52
Nov. 4	.31	.49	.66	.80	.88	.93	1.09	1.18	1.25	1.28	1.28	1.28
Nov. 5	.22	.38	.38	.39	.39	.39	.39	.39	.39	.39	.39	.39
Nov. 22	.21	.28	.36	.37	.43	.43	.43	.43	.43	.43	.43	.43
Nov. 23	.22	.28	.30	.37	.58	.60	.61	.61	.61	.62	.62	.62
Nov. 23	.22	.45	.55	.57	.59	.73	.77	.79	.80	.81	.81	.84
Dec. 3	.48	.89	1.14	1.24	1.45	1.67	1.72	1.75	1.78	1.80	1.80	1.80
Dec. 3	.35	.65	.85	1.02	1.23	1.24	1.26	1.26	1.26	1.26	1.26	1.26
Dec. 6	.17	.25	.32	.40	.52	.56	.57	.57	.57	.57	.57	.57
Dec. 6	.28	.41	.45	.47	.49	.50	.51	.58	.69	.69	.69	.69
Dec. 6	.19	.32	.45	.56	.81	.96	1.01	1.06	1.08	1.08	1.16	1.19
Dec. 7	.23	.32	.47	.55	.56	.56	.56	.60	.64	.64	.64	.64
HAWAII												
Honolulu* T.H.												
Mar. 10	.42	.60	.81	.99	1.27	1.36	1.41	1.48	1.49	1.50	1.50	1.50
Mar. 11	.39	.67	.86	.99	1.39	2.05	2.34	2.81	3.25	3.60	3.87	3.90
Mar. 12-13	.39	.50	.55	.60	.67	.83	.94	1.40	1.69	1.74	1.82	2.03
Mar. 26	Missing. Register inoperative						1.29	1.44	1.57	1.66	1.77	1.88
Oct. 27	.16	.28	.36	.41	.45	.60	.66	.69	.80	1.12	1.35	1.52
Oct. 27	.17	.27	.37	.37	.38	.38	.38	.64	.65	.65	.92	1.20
Dec. 10	.21	.39	.48	.51	.63	.72	.83	.89	.91	.91	.91	.91
Dec. 31	.14	.27	.34	.40	.57	.85	.99	1.11	1.20	1.30	1.47	1.68

* City Office January. Airport Office February–December, inclusive.

Table 9

SUNSHINE, AMOUNT AND PERCENT

YEAR 1951

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
ALABAMA																										
Birmingham	147	46	158	51	150	41	220	56	327	76	239	55	318	73	307	74	241	65	237	67	161	51	140	45	2645	61
Mobile CO	155	48	174	56	169	46	248	64	322	76	245	58	247	57	283	69	152	41	249	70	211	66	132	42	2587	58
Montgomery	187	59	202	65	213	57	303	78	368	86	324	76	340	78	338	82	215	58	256	72	183	58	163	52	3092	70
ARIZONA																										
Phoenix CO	279	88	275	89	331	89	325	83	409	95	418	97	406	93	338	82	355	96	326	93	268	86	211	68	3941	89
Prescott CO	220	70	232	73	308	83	257	66	357	82	410	95	341	77	272	65	335	90	284	81	227	73	172	56	3415	76
Tucson	266	83	268	87	310	83	315	81	408	95	418	98	331	76	325	79	337	91	299	85	275	87	225	72	3777	85
Yuma	299	94	297	96	354	95	360	92	423	99	423	99	410	95	357	86	369	99	333	94	287	91	246	79	4158	94
ARKANSAS																										
Fort Smith	156	50	163	54	159	43	211	54	297	68	211	48	301	68	330	81	245	66	213	61	127	41	123	41	2536	57
Little Rock	157	50	160	52	188	51	234	60	410	95	266	61	323	73	328	79	255	69	233	66	146	47	141	46	2841	62
CALIFORNIA																										
Eureka CO	64	21	74	25	187	50	105	26	207	46	155	34	130	28	143	33	64	17	150	44	78	26	85	29	1442	32
Fresno	150	48	241	79	322	87	333	84	418	96	431	98	443	99	419	100	369	99	336	96	255	83	170	56	3887	87
Los Angeles CO	223	71	239	78	286	77	196	50	339	79	252	58	355	81	331	80	303	82	297	85	226	72	189	61	3236	73
Red Bluff	93	31	147	49	284	77	290	73	345	77	443	99	454	100	397	93	331	89	278	80	158	53	158	54	3378	76
Sacramento	83	27	144	48	282	76	277	70	368	83	427	96	443	98	402	95	345	93	277	80	158	52	122	41	3328	72
San Diego	241	75	245	80	264	71	174	45	264	61	241	56	285	65	272	66	221	59	243	69	239	76	203	65	2892	65
San Francisco CO	140	46	170	56	299	81	175	44	307	70	252	57	252	56	225	53	198	53	268	77	146	48	124	42	2556	57
COLORADO																										
Denver	205	68	208	70	276	74	209	53	270	61	231	52	295	65	261	61	289	77	223	64	226	75	177	61	2870	65
Grand Junction	147	49	190	63	283	76	260	65	305	69	343	77	363	80	274	65	333	89	247	71	190	63	149	51	3084	69
Pueblo	177	58	179	59	206	55	159	40	194	44	218	49	293	65	262	62	274	73	204	59	199	66	177	60	2542	58
CONNECTICUT																										
Hartford	140	48	134	45	160	43	209	52	246	54	206	45	263	57	240	56	197	53	148	43	139	47	140	49	2222	50
New Haven	156	52	165	56	200	54	265	66	279	59	229	51	296	65	271	63	242	65	174	51	154	52	150	52	2581	57
FLORIDA																										
Apalachicola	255	79	255	82	259	70	289	75	362	85	336	80	312	76	220	72	180	49	281	79	191	60	119	37	3059	70
Jacksonville	229	71	225	72	242	65	240	62	302	71	243	58	245	57	236	58	137	37	198	56	202	63	150	47	2649	60
Key West CO	215	64	238	75	259	70	246	64	336	81	340	83	279	67	305	76	277	75	236	66	212	64	236	71	3179	71
Miami CO	230	69	209	66	238	64	229	60	317	76	286	69	215	51	236	58	215	58	209	58	182	56	191	58	2757	62
Pensacola	224	69	225	72	240	65	286	74	342	82	324	77	324	75	325	79	225	61	312	88	234	73	170	54	3231	72
Tampa	273	83	258	82	239	64	196	51	312	75	287	70	214	51	265	66	263	71	274	77	198	61	156	48	2935	66
GEORGIA																										
Atlanta	184	58	190	61	193	52	292	75	381	88	339	79	345	79	345	83	244	66	262	75	170	54	148	48	3093	68
Macon	210	66	222	72	211	57	312	80	384	89	349	81	359	82	373	90	262	71	269	76	212	67	156	50	3319	75
Savannah	198	62	195	63	179	48	237	61	322	75	255	60	218	50	283	69	153	41	144	41	157	50	126	40	2467	55
IDAHO																										
Boise	112	39	133	45	219	59	338	84	348	76	399	87	421	90	342	79	325	87	202	59	121	42	77	28	3037	68
Pocatello	99	34	144	49	204	55	305	77	333	73	389	85	341	73	258	60	310	83	169	49	109	37	42	15	2703	61
ILLINOIS																										
Cairo CO	138	45	123	40	170	46	226	57	372	85	277	63	326	73	347	83	243	65	267	77	139	45	120	40	2748	62
Chicago	131	44	107	36	186	50	145	36	286	63	256	56	304	66	237	55	232	62	196	57	142	48	119	42	2341	52
Moline	127	43	104	35	170	46	171	43	284	63	197	43	305	66	266	62	232	62	171	50	147	50	105	37	2279	51
Peoria	127	43	119	40	185	50	202	51	313	70	219	49	306	67	276	65	220	59	182	53	146	49	109	38	2404	54
Springfield	128	43	128	43	172	46	161	40	318	72	240	54	340	75	313	74	230	62	199	58	146	49	110	38	2485	55
INDIANA																										
Evansville	119	39	99	33	161	44	228	58	349	79	267	60	345	77	323	77	277	74	231	66	121	40	89	30	2609	59
Fort Wayne	88	29	118	40	170	46	185	46	301	67	404	89	346	75	318	75	254	68	218	63	146	49	122	43	2670	60
Indianapolis	105	35	115	38	152	41	177	44	329	74	291	65	347	76	317	75	244	65	229	66	109	36	135	46	2550	55
Terre Haute	136	45	120	39	160	43	181	46	328	74	226	51	339	75	308	73	218	58	238	69	111	37	97	33	2462	54
IOWA																										
Burlington	144	48	131	44	177	48	179	45	299	67	178	39	273	60	272	64	219	59	186	54	197	66	148	51	2403	54
Charles City CO	147	50	---	--	162	44	131	33	238	52	191	42	270	58	223	52	210	56	163	48	133	46	108	38	----	--
Des Moines	168	57	118	40	143	39	155	39	276	61	194	43	276	60	299	70	203	54	166	48	138	47	86	30	2222	50
Sioux City	157	54	129	44	200	54	187	47	342	75	279	61	335	72	247	58	189	50	197	57	183	62	131	46	2576	58
KANSAS																										
Concordia CO	195	64	146	49	215	58	180	45	258	58	201	45	226	50	277	65	168	45	178	52	170	57	137	47	2351	53
Dodge City	225	74	195	65	271	73	245	62	273	62	270	61	270	64	303	72	204	55	207	60	217	71	182	61	2862	65
Topeka	144	47	110	37	166	45	150	38	256	58	185	42	193	43	231	54	183	49	201	58	157	52	141	48	2117	47
Wichita	212	69	176	58	250	67	247	62	314	71	246	56	292	65	317	75	209	56	203	58	164	53	174	58	2804	63
KENTUCKY																										
Louisville	108	35	107	35	137	37	201	51	339	77	273	61	304	68	298	71	271	73	222	64	122	40	111	38	2493	56
LOUISIANA																										
New Orleans CO	157	49	163	52	156	42	247	64	316	75	238	57	228	53	290	71	151	41	292	82	213	67	166	52	2617	59
Shreveport	188	59	155	50	161	43	237	61	321	75	280	65	365	84	386	94	288	78	266	75	176	56	172	55	2995	71
MAINE																										
Eastport CO	149	52	98	33	157	43	145	36	256	56	275	59	308	65	235	54	256	68	191	56	100	35	110	40	2280	51
Portland	170	59	144	49	183	49	204	51	290	63	257	56	301	65	227	53	237	63	150	44	136	47	152	54	2451	55
MARYLAND																										
Baltimore	113	37	164	55	166	45	164	41	222	50	185	42	252	56	253	60	213	57	161	46	108	36	130	44	2131	47
MASSACHUSETTS																										
Blue Hill Obs.	108	38	110	39	105	30	195	50	248	57	189	43	247	56	215	52	214	60	153	46	140	50	136	50	2060	48
Boston	162	55	140	47	152	41	232	58	269	59	258	57	297	64	235	55	249	66	161	47	146	49	163	58	2464	55
Nantucket	97	33	89	30	145	39	220	55	271	60	238	53	280	61	234	55	224	60	134	39	137	46	120	42	2189	49
MICHIGAN																										
Alpena CO	137	48	124	42	158	43	199	49	336	73	309	66	339	72	291	67	223	59	125	37	89	31	77	28	2407	54
Detroit	89	30	106	36	157	42	141	35	298	66	285	62	304	66	286	67	240	64	204	84	99	34	121	43	2330	52
Escanaba CO	127	45	124	43	210	57	219	54	355	77	304	65	302	64	220	51	211	56	114	34	130	46	132	49	2448	53
Grand Rapids	87	30	115	39	140	38	189	47	298	66	260	57	316	68	266	71	232	62	164	48	104	35	55	20	2226	50
Lansing	54	19	102	35	134	36	159	40	282	62	268	59	310	67	288	67	245	65	191	56	93	32	68	24	2194	49
Marquette CO	89	32	123	42	163	44	176	43	281	60	288	61	353	74	198	55	198	53	105	31	105	37	91	34	2170	49
Sault Ste. Marie	109	39	104	36	130	35	166	41	241	52	248	52	265	55	179	41	175	47	99	29	78	28	87	33	1881	42
MINNESOTA																										
Duluth	132	47	127	44	185	50	204	50	288	62	282	60	347	73	215	49	137	36	99	29	119	42	115	43	2250	50
Minneapolis	159	56	121	42	167	45	145	36	271	59	254	54	319	68	200	46	174	46	149	44	109	38	103	38	2171	49
MISSISSIPPI																										
Jackson	169	53	151	49	163	44	239	62	340	79	247	58	290	67	350	85	238	64	251	71	186	59	179	57	2803	63
Vicksburg CO	142	45	154	50	187	50	255	65	333	78	261	61	309	71	355	86	245	66	247	70	180	57	165	53	2833	64

SUNSHINE, AMOUNT AND PERCENT

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
MISSOURI																										
Columbia	157	52	138	46	186	50	204	51	343	77	231	55	303	67	279	66	233	62	193	56	140	48	136	46	2543	57
Kansas City	163	54	118	39	197	53	182	46	288	65	215	48	291	64	300	71	202	54	153	44	196	65	147	50	2452	54
St. Joseph	153	51	116	39	171	46	166	42	280	63	188	42	299	66	299	70	201	54	184	53	156	52	121	42	2334	52
St. Louis CO	151	49	124	41	200	54	223	56	371	84	289	65	*301	*67	293	69	253	68	218	63	161	53	107	36	2691	60
Springfield	160	52	161	53	197	53	193	49	310	71	197	45	264	59	304	72	233	62	168	48	125	41	125	40	2437	55
MONTANA																										
Billings	128	45	143	49	227	61	255	63	330	71	321	68	341	72	302	69	266	71	168	49	135	47	81	30	2697	58
Great Falls	122	44	149	52	198	54	256	63	337	72	275	58	381	79	278	63	201	53	122	36	109	39	73	28	2501	56
Havre CO	140	51	167	59	222	60	307	75	324	69	317	66	415	86	293	66	229	61	139	41	94	34	87	34	2734	61
Helena	171	61	194	67	219	59	285	70	318	68	324	69	381	80	307	70	229	61	137	41	127	45	85	32	2777	62
Missoula	63	23	96	33	112	30	267	65	243	52	257	54	360	75	260	59	191	51	89	26	93	33	52	20	2083	47
NEBRASKA																										
Lincoln CO	219	73	152	51	205	55	163	41	265	59	186	41	294	64	263	62	158	42	175	51	177	59	157	54	2414	54
North Platte	137	46	146	49	233	63	219	55	212	47	217	48	242	53	224	52	216	58	202	59	167	56	141	49	2356	53
Omaha	139	47	126	42	189	51	152	38	285	63	198	44	327	71	275	64	189	50	180	52	140	47	118	41	2318	52
Valentine	158	54	175	59	267	72	286	71	287	63	299	65	306	66	275	64	233	62	184	54	199	68	136	48	2805	63
NEVADA																										
Ely	128	42	161	53	247	67	258	65	219	49	277	62	358	79	315	75	340	91	245	71	195	65	146	50	2889	64
Reno	159	53	172	57	287	78	289	73	374	84	399	89	431	95	373	88	352	94	264	76	197	66	128	44	3425	77
Winnemucca	110	37	111	37	196	53	301	75	384	86	433	96	435	95	369	87	363	97	260	75	190	64	111	38	3263	75
NEW HAMPSHIRE																										
Concord	175	60	143	48	158	43	184	46	267	59	199	43	324	70	252	58	174	46	142	41	113	39	167	60	2298	51
Mt. Washington	90	31	118	39	97	26	67	16	181	39	98	29	91	19	90	20	144	33	148	43	95	34	55	19	1274	28
NEW JERSEY																										
Atlantic City CO	187	62	197	66	220	59	262	66	276	62	296	66	324	72	304	72	258	69	182	53	155	51	128	44	2789	63
Trenton CO	157	52	191	64	226	61	272	68	271	61	264	59	312	68	300	71	257	69	192	56	159	53	162	56	2763	62
NEW MEXICO																										
Albuquerque	236	75	223	73	254	68	279	71	323	74	394	91	329	74	288	69	337	91	283	81	228	74	195	64	3369	76
Roswell	239	75	222	72	250	67	327	84	330	77	343	80	346	79	326	79	339	91	269	77	217	69	211	68	3419	77
NEW YORK																										
Albany	101	35	91	31	168	45	204	51	289	64	222	48	268	58	251	58	241	64	201	59	121	41	124	44	2281	51
Binghamton CO	93	32	107	36	139	38	182	45	293	65	236	52	288	62	226	53	190	51	143	42	84	29	96	34	2077	47
Buffalo	90	31	121	41	145	39	153	38	308	68	260	57	279	60	266	62	229	61	173	51	79	27	83	29	2186	49
New York CO	158	53	176	59	216	58	259	65	292	65	286	63	313	68	298	70	245	65	195	57	177	59	152	52	2767	61
Oswego CO	51	18	96	33	129	35	174	43	325	71	265	57	312	67	293	68	226	60	172	50	70	24	39	14	2152	48
Rochester	50	17	103	35	94	25	132	33	315	69	252	55	290	62	282	65	243	65	172	50	102	35	81	29	2116	45
Syracuse	69	24	114	39	137	37	171	42	309	68	239	52	231	50	261	60	207	55	165	48	82	28	58	21	2043	46
NORTH CAROLINA																										
Asheville CO	151	48	187	61	193	52	226	58	318	73	281	64	304	69	306	73	250	67	244	70	155	50	183	60	2798	62
Charlotte CO 1/	163	52	193	63	193	52	269	68	350	80	317	73	349	79	345	83	271	73	275	79	197	64	166	54	3088	69
Greensboro	167	54	184	60	187	49	237	60	286	66	276	63	316	71	284	65	269	72	233	67	201	46	178	59	2808	62
Hatteras CO	195	62	181	57	213	57	289	74	316	73	321	74	314	71	276	66	244	66	189	54	166	53	143	47	2847	64
Raleigh CO	179	57	180	57	192	52	251	64	294	67	250	57	255	57	240	57	202	54	139	40	188	61	137	45	2507	56
Wilmington CO 2/	157	50	159	52	188	50	245	63	262	61	228	53	203	46	198	48	146	49	218	61	201	64	169	55	2374	53
NORTH DAKOTA																										
Bismarck	211	75	162	56	240	65	250	61	346	85	288	61	361	75	238	54	174	46	150	45	151	54	120	45	2691	60
Devils Lake CO	180	65	118	41	198	54	252	61	371	79	263	55	356	74	212	48	164	44	147	44	168	60	123	47	2552	57
Fargo	176	63	115	40	191	52	205	50	373	80	302	64	338	71	218	50	148	39	150	44	163	58	129	48	2508	56
Williston	153	55	156	54	248	67	279	68	363	77	298	62	427	88	284	64	178	47	141	42	120	43	113	43	2760	62
OHIO																										
Cincinnati CO 3/	110	36	121	40	131	35	157	40	270	61	217	49	276	61	245	58	244	65	225	65	99	33	112	38	2207	50
Cleveland	71	24	74	24	143	39	131	33	266	59	231	51	348	76	294	69	243	65	218	63	89	30	94	33	2202	49
Columbus CO	110	37	124	41	193	52	179	45	221	66	230	51	286	63	275	65	240	64	234	68	115	38	121	42	2328	55
Dayton	121	40	141	47	198	53	179	45	317	71	255	57	320	70	291	68	239	64	245	71	140	47	130	45	2576	58
Sandusky	103	35	136	46	188	51	194	49	323	72	323	70	342	74	318	74	301	81	245	71	139	47	140	49	2752	62
Toledo	74	25	88	30	135	36	145	36	254	56	191	42	267	58	249	58	183	49	203	59	111	38	111	39	2011	45
OKLAHOMA																										
Tulsa	178	57	175	58	191	51	218	55	328	75	268	61	352	79	349	83	258	69	219	63	170	55	171	56	2877	65
OREGON																										
Baker CO	91	32	135	46	207	56	320	79	327	71	347	74	444	94	382	88	323	86	193	57	126	44	97	35	2992	64
Portland	93	33	110	38	131	35	264	65	217	47	323	69	335	71	305	70	250	67	117	35	62	22	77	28	2284	51
Roseburg	57	20	83	28	169	46	297	74	320	70	418	91	390	84	385	89	277	74	107	31	71	24	38	14	2612	54
PENNSYLVANIA																										
Erie CO	57	19	289	31	146	39	177	44	320	71	268	59	289	63	269	63	231	62	158	46	78	27	48	17	2330	45
Harrisburg	131	44	154	51	200	54	228	57	264	59	234	52	292	64	302	71	259	69	193	56	150	50	128	44	2535	57
Philadelphia CO	160	53	184	62	210	57	246	62	275	62	237	53	297	65	280	66	259	69	201	58	170	57	162	56	2681	60
Pittsburgh	104	35	110	37	136	37	152	38	221	49	244	54	285	62	255	60	247	66	189	55	110	37	111	38	2164	49
Reading CO	142	47	156	52	200	54	239	60	275	61	239	53	267	59	283	66	240	64	177	65	115	38	110	38	2443	54
Scranton CO	96	32	123	40	161	43	176	44	276	61	229	51	259	56	227	53	192	51	140	41	82	28	102	36	2063	45
RHODE ISLAND																										
Providence	148	50	147	50	165	45	270	67	313	70	288	63	308	67	288	67	268	71	191	56	156	53	142	50	2684	60
SOUTH CAROLINA																										
Charleston CO	203	64	215	70	219	59	276	71	336	78	275	64	277	64	294	71	189	51	152	43	182	58	165	53	2783	63
Columbia CO	176	56	214	70	209	56	291	74	374	87	285	66	278	63	304	73	201	54	197	53	189	60	128	42	2846	64
Greenville	172	56	209	68	204	55	295	75	353	81	271	63	334	76	335	80	244	66	262	75	191	62	151	49	3021	67
SOUTH DAKOTA																										
Huron	137	48	157	53	225	61	239	59	295	64	304	66	309	66	303	70	236	63	184	54	169	58	103	37	2661	60
Rapid City	176	61	179	61	274	74	275	68	219	48	243	52	280	60	258	59	198	53	163	48	160	55	104	38	2529	56
TENNESSEE																										
Chattanooga	118	38	104	34	111	30	210	54	354	81	267	61	299	68	267	64	216	58	187	53	106	34	132	43	2371	52
Knoxville	119	38	127	42	129	35	148	38	265	61	209	48	272	61	226	54	197	53	196	56	106	34	125	41	2119	48
Memphis	139	44	141	46	155	42	223	57	372	86	280	64	321	73	360	86	281	76	252	72	158	51	125	41	2807	63
Nashville	93	30	110	36	137	37	169	43	311	71	208	48	248	56	257	61	220	59	203	58	132	43	145	48	2233	49
TEXAS																										
Abilene	214	67	194	63	223	60	289	74	269	63	---	--	384	88	373	90	287	77	277	78	222	70	191	61	----	--
Amarillo	207	66	181	59	232	62	264	67	261	60	279	64	298	67	309	74	280	75	236	67	211	68	189	62	2947	66
Austin	216	67	174	56	184	50	234	60	225	53	268	63	368	85	370	90	276	75	245	69	152	48	159	50	2871	65
Brownsville	167	50	194	59	151	41	140	37	213	51	289	70	343	81	303	75	257	70	244	68	166	51	224	69	2691	60
Corpus Christi	201	61	222	71	255	69	303	79	288	69	335	81	393	92	380	93	238	64	221	62	112	35	141	44	3089	69

* Estimated
1/ Changed to airport beginning May 1951.
2/ Changed to airport beginning August 1951.
3/ Changed to Abbe Observatory beginning April 18, 1951.

SUNSHINE, AMOUNT AND PERCENT

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible	Hours	Percent of possible
TEXAS (Cont'd.)																										
Dallas	174	55	148	48	163	44	268	69	282	66	266	62	381	87	392	94	307	83	267	76	202	64	188	61	3038	67
Del Rio CO	235	72	222	71	251	67	304	79	286	68	314	75	354	83	343	84	304	82	228	64	229	71	225	70	3295	74
El Paso	255	80	246	79	267	72	312	80	364	85	407	96	329	76	319	77	340	92	290	82	263	83	229	73	3621	81
Galveston CO	164	50	170	54	168	45	206	53	296	70	345	82	324	76	354	87	201	54	267	75	141	44	108	34	2744	60
Houston CO	211	65	182	58	185	50	293	76	294	69	310	74	356	83	363	88	233	63	240	68	110	34	116	36	2893	65
Palestine CO	184	57	159	52	227	61	276	71	313	73	324	76	377	87	380	92	269	73	249	70	183	58	166	53	3107	70
Port Arthur CO	192	59	196	63	201	54	245	63	299	71	282	67	257	60	314	77	184	50	230	65	156	49	150	47	2706	62
San Antonio	180	55	156	50	175	47	243	63	212	50	282	67	361	84	369	90	259	70	242	68	149	47	159	50	2787	63
UTAH																										
Salt Lake City	109	37	154	52	217	59	272	68	301	67	344	76	385	84	315	74	341	91	198	57	160	54	101	35	2897	65
VERMONT																										
Burlington	59	21	102	35	122	33	116	29	243	53	225	48	241	51	188	43	182	48	111	32	66	23	52	19	1707	36
VIRGINIA																										
Cape Henry CO	189	61	179	59	192	52	293	74	333	76	330	75	355	80	305	73	286	77	200	57	165	54	167	56	2994	68
Lynchburg	170	55	180	60	169	45	217	55	277	63	253	57	313	70	283	67	240	65	196	56	151	50	132	44	2581	57
Norfolk CO	214	70	178	59	200	54	291	74	320	73	337	77	295	66	257	61	215	58	169	48	169	55	137	46	2782	63
Richmond	181	59	180	59	219	59	266	67	302	69	290	65	300	67	267	64	241	65	144	41	162	53	124	42	2676	60
Washington Nat'l. Airport	150	49	157	53	199	54	191	48	255	58	254	57	349	77	324	77	225	60	160	46	144	48	126	43	2534	57
WASHINGTON																										
North Head CO	63	23	108	37	132	36	214	53	214	46	196	42	170	36	232	53	114	30	135	40	94	33	83	31	1755	39
Seattle CO	70	25	134	45	185	50	311	76	316	67	355	74	345	72	244	55	202	54	107	32	53	19	60	23	2382	53
Spokane	79	28	99	34	136	37	308	75	248	53	284	59	390	81	328	74	242	63	95	28	44	16	31	12	2284	47
Tacoma CO	80	29	118	41	144	39	285	70	291	62	336	71	326	68	285	65	200	53	109	32	68	24	75	28	2317	52
Tatoosh CO	62	23	104	36	117	32	261	63	190	40	190	39	155	32	118	27	104	27	96	29	66	24	59	23	1522	29
Walla Walla CO	60	21	143	49	198	54	341	84	335	72	360	77	429	90	360	82	276	73	159	47	95	33	43	16	2799	63
WEST VIRGINIA																										
Elkins	111	37	118	39	144	39	156	39	253	57	244	55	272	60	244	58	205	55	198	57	85	28	107	36	2137	48
Parkersburg CO	109	35	128	43	189	51	188	47	318	72	295	66	339	75	289	68	245	66	214	62	79	26	89	30	2482	53
WISCONSIN																										
Green Bay	141	49	109	37	190	51	133	33	296	64	288	62	303	64	219	50	198	53	153	45	130	45	104	38	2264	51
Madison	133	45	97	33	166	45	140	35	268	59	247	54	334	72	243	56	230	61	179	52	152	52	105	37	2294	51
Milwaukee	112	38	63	21	170	46	132	33	270	59	200	43	304	65	210	49	247	66	205	60	150	51	107	38	2170	49
WYOMING																										
Cheyenne	163	55	181	61	263	71	206	52	278	62	274	60	284	62	237	55	256	68	212	62	224	75	154	54	2732	61
Lander	171	58	189	64	222	60	258	64	285	63	347	76	348	75	296	69	258	69	188	55	178	61	154	55	2894	65
Sheridan	155	54	191	65	250	68	253	62	305	66	294	63	356	76	326	75	240	64	172	51	168	59	127	47	2837	63
PACIFIC AREA																										
Honolulu, T.H. CO 4/	267	78	201	61	170	46	221	58	275	67	237	59	289	70	299	75	265	72	227	63	209	63	155	46	2815	63
Lihue, T.H.	182	54	166	52	153	41	190	50	273	67	261	65	252	61	255	64	221	60	200	55	172	52	128	38	2453	55
PUERTO RICO																										
San Juan	148	43	207	64	271	73	222	59	259	64	224	56	216	53	282	71	182	50	210	58	228	67	209	61	2658	60
ALASKA																										
Anchorage	93	46	112	44	224	61	133	30	276	51	172	30	285	50	85	17	51	13	130	42	50	23	45	26	1656	36
Fairbanks	48	29	128	54	274	68	161	35	329	57	228	35	175	28	---	--	---	--	---	--	---	--	---	--	----	--
Juneau	61	27	106	41	112	31	146	34	160	27	173	32	296	55	120	25	97	25	67	21	42	18	44	22	1424	31

4/ Changed to airport February 1, 1951. Sunshine record incomplete for February.

ANNUAL CLIMATOLOGICAL DATA

Table 10

YEAR 1951

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max temp		Min. temp	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
ALABAMA Birmingham	74.7	51.7	63.2	100	Aug. °31	7	Feb. 2	2640	64.40	5.89	Mar. 28	0.2	0.2	Feb. 1	81 AP	86 AP	55 AP	64 AP	8.1	S	65	NW	May 3	61	5.8	104	121	140	115	0	62	7	80	1	60	0
Mobile CO	77.6	59.4	68.5	100	Aug. 30	12	Feb. 3	1535	61.03	6.52	Mar. 18-19	T	T	Feb. °1	86 AP	87 AP	56 AP	75 AP	11.0	---	50	---	June 10	58	5.5	112	127	126	101	0	64	18	83	1	15	0
Montgomery CO	78.2	54.1	66.2	102	Aug. 29	10	Feb. 3	2078	38.65	3.84	Sept. 24	T	T	Feb. °1	82	86	52	63	6.8	S	43	SW	Aug. 6	70	5.1	127	124	114	105	0	63	18	107	1	41	0
ARIZONA Flagstaff	60.1	29.8	45.0	90	July 7	-8	Dec. 9	7340	25.79	3.11	Dec. 29-30	97.7	10.7	Mar. 1-2	--	--	42	42	----	SW	*36	* SSW	Feb. 27	--	4.4	176	76	113	69	27	36	10	1	19	211	15
Payson CO	71.0	41.4	56.2	102	July 30	11	Dec. 21	4192	28.06	3.49	Aug. 27-28	24.9	6.8	Mar. 1-2	57 AP	63 AP	39 AP	42 AP	4.8 AP	NE AP	*31	* SSW	Mar. 30	--	4.2 AP	183 AP	77 AP	105 AP	75	9	41	2	73	1	105	0
Phoenix CO	84.5	57.5	71.0	112	May 26	29	Jan. 2	1305	12.82	2.72	Aug. 27-28	T	T	Apr. 19	52	61	34	29	4.8	E	*35	W	Apr. 26	89	3.4	208	80	77	39	0	14	2	157	0	7	0
Prescott	69.7	39.7	54.7	98	July 6	8	Dec. 21	4612	14.58	1.66	Dec. 30	21.0	3.6	Mar. 1-2	51	59	34	32	[illegible].9	SW	38	SW	Dec. 31	76	4.0	193	73	99	59	9	42	4	58	2	131	0
Tucson	82.2	54.4	68.3	108	July 30	26	Mar. 4	1723	11.70	1.86	Oct. 29-30	2.8	1.8	Dec31-Jan.1	45	54	30	26	6.8	SE	55	E	Nov. 17	85	3.8	193	87	85	57	2	32	3	146	0	21	0
Winslow	70.5	40.4	55.5	102	July 8	5	Dec. 21	4625	6.96	1.11	Aug. 27-28	2.7	1.6	Dec31-Jan.1	46	56	31	26	8.7	SW	*57	* ESE	July 18	--	3.9	194	80	91	43	0	27	1	85	6	129	0
Yuma	89.3	59.4	74.4	115	May °26	31	Jan. 2	886	2.95	.90	Aug. 28-29	.0	.0	-----	41	52	29	21	7.9	SSE	50	SE	July 28	94	2.5	249	73	43	18	0	10	3	184	0	3	0
ARKANSAS Fort Smith	71.9	49.4	60.7	104	Aug. 31	-9	Feb. 2	3495	58.11	5.90	Oct. 26-27	5.1	2.4	Jan. 30-31	79	84	55	59	8.5	NE	58	N	June 8	57	5.4	135	96	134	103	2	72	8	79	7	76	2
Little Rock	72.0	51.5	61.8	104	Aug. 31	-5	Feb. 2	3149	46.43	2.60	July 24	3.8	3.0	Jan. 31	79	85	58	63	7.5	SW	40	NE	Dec. 4	62	5.9	105	113	147	111	2	64	21	75	7	61	1
Texarkana	74.9	53.6	64.3	105	Aug. °17	-3	Feb. 2	2575	43.79	2.61	July 1-2	4.3	3.2	Jan. 31	78	85	57	61	9.3	SSE	57	W	May 9	--	5.6	116	106	143	97	2	67	16	88	5	46	1
CALIFORNIA Bakersfield	78.9	51.5	65.2	107	Sept 16	26	Dec. 9,10	2063	5.71	.58	Jan. 29-30	T	T	Jan. °11	54	66	45	34	5.0	NW	38	NW	May 11	--	3.2	224	65	7[illegible]	39	0	3	6	128	0	18	0
Beaumont	74.1	45.2	59.7	103	July 31	24	Jan. 1	3014	15.59	3.33	Dec. 29-30	5.9	3.0	Mar. 1-2	--	--	37	36	----	---	*36	*E	Dec. 10	--	3.6	214	68	83	60	3	9	50	83	0	39	0
Bishop	75.3	38.1	56.7	105	July 9	10	Dec. 9	4145	6.43	1.42	Dec. 29-30	6.9	3.0	Dec. 3	--	--	26	22	----	---	--	---	----	--	4.2	172	101	92	33	3	20	1	110	0	142	0
Blue Canyon	58.6	41.9	50.3	88	Sept 15	13	Dec. 31	5719	80.21	4.63	Oct. 23-24	314.4	17.3	Mar. 4-5	--	--	49	53	----	---	*45	* SSW	Dec. 1	--	4.[illegible]	170	56	139	88	46	14	81	0	28	104	0
Burbank	74.4	50.9	62.7	101	Sept 17	32	Feb. 28	1778	13.37	2.28	Dec. 29-30	T	T	Feb. °22	73	78	52	47	5.4	S	*45	*NE	Dec. 9	--	3.9	195	98	72	43	0	5	32	36	0	1	0
Eureka CO	56.2	46.4	51.3	71	Oct. 10	28	Jan. 30	4901	45.04	3.82	Feb. 3-4	T	T	Jan. °11	--	--	--	--	6.9	---	45	S	Dec. 4	32	7.6	46	88	231	116	0	5	33	0	0	6	0
Fresno	76.8	47.9	62.4	107	July 18	25	Dec. 9	2553	9.69	.95	Apr. 28-29	T	T	Apr. °29	70	84	57	42	6.7	NW	38	W	Feb. 11	87	3.[illegible]	203	66	96	40	0	4	29	110	0	32	0
Los Angeles CO	72.9	54.2	63.6	96	Oct. 7	32	Dec. 9	1362	14.33	2.86	Dec. 29-30	T	T	Feb. °27	--	--	49	54	5.8	W	35	E	Jan. 10	73	4.1	180	104	81	37	0	10	10	14	0	1	0
Los Angeles	68.6	53.3	61.0	96	Oct. 7	33	Dec. 8	1763	11.06	3.01	Dec. 29-30	T	T	Feb. °27	79	82	60	66	5.3	WSW	*54	*W	Apr. 29	--	4.5	151	135	79	38	0	3	39	2	0	0	0
Mt. Shasta CO	63.1	36.8	50.0	97	Aug. 17	9	Jan. 30	5793	37.65	2.88	Dec. 26-27	111.6	16.1	Jan. 20-21	66	74	54	48	8.0	SE	*32	*NW	Jan. 1	--	4.9	159	71	135	87	26	9	18	34	8	138	0
Oakland	64.8	4[illegible].6	56.7	94	May 25	31	Jan. 31	3033	22.20	2.21	Dec. 27-28	T	T	Feb. °21	78	83	68	60	6.3	W	*48	*SW	Dec. 1	--	5.7	98	126	141	71	0	2	21	4	0	5	0
Red Bluff	75.1	50.8	63.0	110	Sept 9	27	Jan. °31	2694	21.21	2.09	Jan. 9-10	.7	.7	Jan. 10	57 AP	67 AP	48 AP	38 AP	7.7	SSE	59	SE	Dec. 4	76 AP	4.5 AP	177 AP	67 AP	121 AP	72	0	13 AP	15 AP	115	0	17	0
Sacramento CO	72.1	49.0	60.6	105	July 18	29	Dec. 9	2567	16.22	1.69	Nov30-Dec.1	T	T	Apr. °28	75	84	61	49	8.2	S	62	S	Dec. 3	72	4.0	201	60	104	60	0	6	33	55	0	10	0
Sandberg CO	64.8	45.8	55.3	95	July 31	19	Dec. 9	4438	6.40	1.58	Dec. 11-12	24.3	4.7	Mar. 1	50	54	41	42	17.9	NW	*97	*E	Dec. 11	--	3.3	223	68	74	39	9	0	89	31	8	63	0
San Diego	69.5	55.2	62.4	91	Oct. 7	37	Dec. 9	1350	11.22	2.04	Dec. 29-30	T	T	Mar. °1	78	81	62	62	6.0	W	35	SW	Mar. 1	65	4.5	160	122	83	53	0	2	29	2	0	0	0
San Francisco CO	60.9	49.7	55.3	89	Sept 8	36	Feb. 28	3511	22.89	1.74	Feb. °4-5	T	T	Feb. °26	--	88	74	68	9.0	W	42	W	Dec. 1	57	6.0	108	92	165	80	0	3	7	0	0	0	0
San Francisco	63.4	47.3	55.4	93	Sept 8	32	Jan. °31	3468	17.55	1.70	Nov30-Dec.1	T	T	Jan. °11	84	88	71	68	10.7	WNW	48	WSW	Dec. 1	--	5.4	126	109	130	67	0	1	18	2	0	4	0
Santa Catalina	66.3	51.8	59.1	92	Sept 17	36	Mar. 2	2703	12.32	2.68	Dec. 29-30	T	T	Feb. °27	--	72	64	62	----	---	--	---	----	--	4.2	191	81	93	49	0	0	111	8	0	0	0
Santa Maria	67.8	45.5	56.7	94	Oct. 6	28	Jan. 1	3010	10.84	.84	Feb. 26-27	.0	.0	----	86	87	62	63	6.8	W	*31	*S	May 3	--	4.4	160	120	85	49	0	2	66	3	0	13	0
COLORADO Alamosa	59.5	23.4	41.5	91	June °29	-30	Feb. 1	8581	4.09	.56	July 30	22.9	4.3	Mar. 27	--	73	38	38	----	---	*48	*SW	Apr. 29	--	4.5	156	134	75	45	8	25	4	6	27	232	46

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature								Precipitation						Relative humidity				Wind							Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date	Degree days	Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Clear	Partly cloudy	Cloudy	Precipitation 01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
COLORADO (Cont'd.)																																				
Colorado Springs	60.0	33.4	46.7	96	July 7	-27	Feb. 1	6957	16.14	3.00	July 22	26.4	5.1	Nov. 1	61	64	39	43	11.2	SSE	*44	* WNW	Jan. 17	--	5.2	127	113	125	94	8	61	19	14	29	176	9
Denver	61.5	35.1	48.3	97	July 15	-25	Feb. 1	6567	19.43	3.43	Aug. 2-3	96.8	8.8	Apr. 9-10	61	66	39	42	8.1	S	44	NW	Dec. 17	65	5.5	105	133	127	105	30	37	9	28	24	162	13
Grand Junction	63.0	38.6	50.8	98	July 30	-14	Feb. 1	6076	8.42	1.16	Dec. 30	32.1	7.4	Jan. 29-30	50	57	40	37	8.3	ESE	66	S	June 1	69	5.3	132	111	122	72	10	38	8	50	30	143	6
Pueblo	65.6	35.4	50.5	102	July 7	-31	Feb. 1	6037	13.05	1.75	Aug. 2-3	43.3	5.6	Nov. 15-16	60	70	39	38	7.6	W	56	W	Dec. 22	58	5.1	135	113	117	80	15	39	5	48	17	170	15
CONNECTICUT																																				
Bridgeport	60.6	43.9	52.3	90	July 31	5	Dec. 17	5228	41.82	2.11	Nov. 2-3	14.2	3.2	Dec. 14-15	81	78	60	71	9.6	SW	47	WNW	Feb. 8	--	6.2	97	100	168	115	4	31	28	2	19	96	0
Hartford	61.1	40.9	51.0	93	July 31	1	Dec. 17	5644	48.65	2.67	Nov. 2-3	40.0	6.2	Dec. 14-15	83	81	58	72	7.8	S	39	NW	Nov. 26	50	7.1	63	98	204	122	13	23	29	8	23	123	0
New Haven	59.9	43.0	51.5	87	July 16	6	Feb. 10	5421	47.54	2.86	Nov. 2-3	23.1	4.1	Jan31-Feb.1	--	--	--	--	7.6	---	42	SE	Oct. 7	57	6.4	89	97	179	136	8	27	25	0	20	100	0
DELAWARE																																				
Wilmington	64.3	43.9	54.1	94	July °27	6	Dec. 17	4846	45.26	2.32	Nov. 7	9.9	6.6	Dec. 14	81	79	55	71	8.1	NW	*35	SSE	Dec. 20	--	6.3	96	97	172	116	3	33	49	14	11	102	0
FLORIDA																																				
Apalachicola CO	75.4	61.6	68.5	93	Aug. °2	21	Feb. 3	1293	52.51	8.75	Sept. 9	.0	.0	-----	85	87	68	77	8.2	---	43	N	Sept 2	70	4.7	150	114	101	75	0	90	26	31	0	10	0
Daytona Beach	80.6	60.0	70.3	96	June 9	30	Jan. °9	815	49.46	4.09	Sept. 30	T	T	Feb. °3	91	91	63	81	9.3	E	*35	WSW	June 17	--	5.0	133	134	98	106	0	80	46	88	0	5	0
Fort Myers	84.7	62.6	73.7	97	June 14	33	Jan. 9	347	55.92	10.85	Oct. 1-2	.0	.0	-----	90	88	54	76	7.7	E	*33	NW	June 18	--	4.9	128	163	74	107	0	102	23	139	0	0	0
Jacksonville CO	79.0	61.3	70.2	98	July °14	25	Feb. 2	1042	40.71	4.25	Oct. 21-22	T	T	Feb. 2	AP 84	AP 84	AP 52	AP 72	AP 6.6	AP SE	AP 42	AP NE	AP Oct2	AP 60	AP 5.7	AP 109	AP 123	AP 133	112	0	AP 62	AP 48	83	0	9	0
Key West CO	84.1	72.1	78.1	95	Aug. °8	47	Jan. 9	71	23.54	3.09	Nov. 5	T	T	Apr. °9	AP 79	AP 80	AP 66	AP 75	8.0	AP E	33	NW	Nov. 17	71	4.7	148	150	67	105	0	57	0	111	0	0	0
Melbourne	81.1	63.3	72.2	95	Aug. °8	34	Jan. 9	482	47.47	3.28	Nov. 16	.0	.0	-----	89	88	63	79	8.8	NE	*30	NNE	May °17	--	5.5	94	171	100	104	0	88	22	78	0	0	0
Miami CO	80.1	69.3	74.7	92	Aug. 30	36	Jan. 9	213	40.93	3.95	Oct. 1-2	.0	.0	-----	AP 83	AP 84	AP 57	AP 71	12.1	---	55	S	Oct. 2	62	5.2	100	190	75	113	0	67	4	10	0	0	0
Orlando	82.3	61.4	71.9	96	June °27	30	Jan. 9	632	57.92	4.03	Nov. 15-16	T	T	Apr. 19	90	90	54	73	9.1	ENE	*45	W	Apr. 2	--	5.3	116	149	100	112	0	83	33	106	0	4	0
Pensacola CO	76.7	61.0	68.9	99	Aug. 30	13	Feb. 3	1391	60.79	7.22	Mar. 18-19	.0	.0	-----	AP 85	AP 85	AP 59	AP 75	7.7	AP SSE	34	NW	Aug. 14	72	5.3	129	114	122	119	0	84	25	62	1	15	0
Tallahassee	79.6	57.8	68.7	99	July 15	18	Feb. 3	1379	50.65	4.25	Mar. 18-19	.2	.2	Feb. 2	84	85	53	70	5.8	SE	--	---	----	--	---	116	129	120	109	0	88	55	101	0	21	0
Tampa	82.7	63.2	73.0	98	June 24	31	Feb. 3	501	43.83	3.90	Sept. 17-18	T	T	Feb. 2	86	88	54	72	7.0	E	43	SW	Apr. 2	66	5.1	116	160	89	93	0	88	27	118	0	1	0
West Palm Beach	84.3	6[illegible].3	75.3	96	June °10	38	Jan. °9	216	52.83	7.48	Oct. 13-14	T	T	Apr. 16	86	86	60	77	8.1	E	42	WNW	June 19	--	5.7	92	166	107	117	0	87	6	122	0	0	0
GEORGIA																																				
Albany	79.6	56.2	67.9	104	July 15	16	Feb. 3	1700	45.40	4.60	Aug. 5-6	T	T	Mar. °13	80	84	48	65	4.8	NE	*56	W	Apr. 2	--	5.0	132	120	113	101	0	73	24	120	1	29	0
Athens	72.7	50.5	61.6	99	June 3	11	Feb. 3	2979	43.85	2.82	July 1	.3	.3	Feb. 9	--	--	--	--	----	---	--	---	----	--	5.3	133	98	134	115	0	52	--	65	1	56	0
Atlanta	72.4	52.1	62.3	96	June °24	8	Feb. 2	2810	48.77	3.34	Dec. 20-21	T	T	Feb. °1	77	82	53	61	8.4	NW	44	NW	Dec. 15	68	5.5	128	97	140	113	0	52	30	60	1	45	0
Augusta	76.5	51.7	64.1	103	June 3	16	Feb. 4	2399	33.73	1.90	Sept. 22-23	T	T	Feb. 9	85	86	51	68	6.2	SE	*33	WNW	Feb. 7	--	5.5	122	110	133	106	0	56	21	85	0	47	0
Columbus	76.6	52.8	64.7	100	June 23	12	Feb. 3	2258	43.38	3.09	Sept. 22	T	T	Feb. °1	83	85	54	67	7.4	N	*60	WNW	May 3	--	5.2	138	98	129	106	0	56	23	93	1	47	0
Macon	78.0	53.7	65.9	101	July °15	14	Feb. 2	2072	38.39	3.44	June 12-13	T	T	Feb. °9	79	84	48	60	9.1	NW	47	SW	Feb. 1	75	5.2	135	102	128	99	0	59	22	105	1	38	0
Rome	73.7	47.9	60.8	100	Sept 1	7	Feb. 2	3214	61.44	7.53	Mar. 28-29	T	T	Jan. °7	87	87	54	72	7.6	N	--	---	----	--	5.6	113	128	124	127	0	62	15	76	1	73	0
Savannah	77.3	55.[illegible]	66.6	101	July 14	21	Feb. 4	1772	48.66	4.60	Aug. 23-24	T	T	Feb. 2	86	86	54	73	7.9	SW	51	SE	July 16	55	5.8	92	137	136	107	0	77	36	79	0	28	0
Valdosta	80.2	56.0	68.1	103	July 16	19	Feb. 4	1508	52.12	3.85	Mar. 19	.0	.0	-----	--	--	--	--	8.3	SW	--	---	----	--	---	115	140	110	102	0	77	43	113	0	28	0
IDAHO																																				
Boise	61.4	3[illegible].5	50.0	103	July 23	1	Jan. 30	6066	13.69	1.00	Feb. 4-5	41.4	5.5	Dec. 29-30	63	70	51	46	8.8	SE	56	S	July 24	68	5.6	128	90	147	97	19	10	14	35	25	133	0
Lewiston	62.8	38.9	50.9	104	July 17	1	Jan. 30	5680	10.13	1.01	June 4-5	12.5	3.5	Mar. 4	63	73	56	48	4.7	E	--	---	----	--	6.1	119	62	184	90	4	10	19	36	16	122	0
Pocatello	58.[illegible]	33.8	46.3	101	July 18	-9	Dec. 9	7149	8.28	.72	Dec. 23-24	46.6	8.2	Dec. 23-24	60	72	50	44	9.0	SW	52	SW	Mar. 15	61	5.6	123	94	148	82	17	23	9	21	39	169	10

See reference notes at end of table.

Table 10—Continued

ANNUAL CLIMATOLOGICAL DATA

YEAR 1951

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max temp		Min temp.	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
ILLINOIS																																				
Cairo CO	67.2	50.0	58.6	100	Aug. 31	-5	Feb. 2	4019	59.32	3.51	Feb. 20	15.7	6.3	Jan. 6	--	83	62	--	8.7	S	43	NW	June 8	62	6.6	84	99	182	133	2	50	8	47	14	65	1
Chicago	57.4	39.4	48.4	92	Aug. 31	-15	Jan. 30	6619	43.15	2.93	May 10-11	68.3	10.0	Dec. 14	76	79	60	67	9.3	S	50	NW	Apr. 28	52	6.8	85	83	197	121	17	35	16	11	49	130	14
Joliet	57.8	36.8	47.3	94	Aug. 31	-20	Feb. 2	6891	42.01	3.54	July 8	50.3	8.0	Nov. 6-7	86	87	64	74	10.7	S	--	---	----	--	6.7	82	87	196	128	17	36	30	8	46	146	19
Moline	57.0	38.4	47.7	97	Aug. 30	-19	Feb. 9	6935	48.80	4.60	Aug. 29	50.5	7.0	Dec. 14	80	83	62	68	10.1	W	57	SW	May °19	51	6.7	81	99	185	134	14	53	19	6	61	145	21
Peoria	58.5	39.7	49.1	96	Aug. 30	-16	Feb. 2	6491	37.23	2.77	July 21-22	41.2	7.2	Nov. 6-7	81	84	64	69	11.0	S	50	W	Sept. 26	54	6.6	88	95	182	129	15	54	18	6	46	135	16
Springfield CO	61.4	43.3	52.4	99	Aug. 30	-10	Feb. 2	5642	37.30	4.07	June 27-28	AP 37.2	AP 8.0	AP Nov. 6-7	AP 81	AP 84	AP 63	AP 68	AP 13.0	AP S	AP 58	AP W	AP Aug. 15	AP 55	AP 6.6	AP 86	AP 96	AP 183	124	AP 12	AP 54	AP 14	19	34	110	7
INDIANA																																				
Evansville	65.4	44.8	55.1	100	Aug. 31	-23	Feb. 2	4872	51.37	2.95	Mar. 17-18	24.1	8.2	Jan. 6-7	84	85	61	68	9.4	NW	45	NW	May 27	59	6.5	87	98	180	137	7	50	17	39	19	98	4
Fort Wayne	58.4	39.3	48.9	98	Aug. 31	-17	Feb. 2	6404	42.63	2.44	July 8-9	36.4	5.9	Jan. 31	85	87	63	72	8.9	SW	57	S	June 27	60	6.8	63	113	189	140	12	39	26	5	45	135	12
Indianapolis	61.6	44.0	52.8	99	Aug. 31	-11	Feb. 2	5451	41.30	2.62	Nov. 13	34.0	6.0	Jan31-Feb.1	AP 83	AP 85	AP 63	AP 71	AP 11.2	AP SW	AP 68	AP W	AP May 3	AP 55	AP 6.6	AP 84	AP 92	AP 189	136	11	AP 40	AP 15	14	34	104	7
South Bend	57.2	38.0	47.6	92	June 1	-17	Feb. 2	6735	44.86	2.86	June 19	78.4	10.3	Nov. 6-7	84	85	64	72	11.7	SSW	45	SW	Mar. °23	--	7.2	63	85	217	139	25	40	33	2	48	144	11
Terre Haute	61.7	41.4	51.6	96	Aug. 31	-20	Feb. 2	5720	39.23	2.04	Oct. 22-23	40.2	6.1	Nov. 5-6	82	83	62	70	8.8	S	57	SW	June 28	54	6.4	95	95	175	145	16	51	22	12	32	119	8
IOWA																																				
Burlington	58.1	38.9	48.5	95	Aug. 30	-16	Feb. 2	6695	38.94	2.34	Aug. 25-26	47.3	6.6	Dec. 14	81	84	65	70	10.2	NW	47	W	Nov. 3	54	7.0	65	105	195	138	14	63	17	10	53	146	18
Davenport CO	57.1	40.2	48.7	95	Aug. 30	-14	Jan. 30	6710	49.61	2.97	May 9-10	61.8	8.1	Dec. 14	--	--	--	--	----	---	--	---	----	--	---	--	---	---	127	15	53	23	5	59	134	18
Des Moines	56.0	37.6	46.8	96	Aug. 30	-15	Feb. 1	7267	38.03	2.68	July 2-3	36.3	7.0	Mar. 11-12	80	83	65	67	11.8	NW	63	NW	Nov. 3	50	6.7	79	94	192	124	14	50	19	8	71	152	26
Dubuque	53.0	34.8	43.9	90	July 27	-26	Jan. 29	7983	45.01	4.36	July 8	67.2	8.4	Dec. 24-25	83	86	67	74	10.8	SSW	45	WSW	Nov. 14	--	6.9	79	85	201	136	20	52	39	1	74	158	29
Sioux City	55.8	34.6	45.2	96	July 20	-17	Dec. 27	7747	34.85	2.62	Aug. 14	41.6	5.6	Mar. 10-11	81	85	63	65	9.6	NW	56	NW	Aug. 14	58	6.7	84	99	182	115	14	57	33	16	68	169	33
KANSAS																																				
Concordia CO	60.8	41.5	51.2	102	Aug. 29	-12	Feb. 1	5931	40.76	4.22	June 20-21	17.6	4.7	Mar. 11	73	79	57	59	8.3	S	35	NW	Mar. °23	53	6.0	109	91	165	104	7	74	10	22	40	126	8
Dodge City	64.7	40.6	52.7	101	Aug. 30	-15	Feb. 1	5538	32.76	3.37	July 10-11	21.8	3.7	Nov. 5	73	79	53	53	14.3	S	78	SW	July 4	65	5.4	125	108	132	99	10	79	26	41	20	141	8
Goodland	62.4	33.8	48.1	99	Aug. 29	-21	Feb. 1	6719	20.95	2.20	June 21	25.8	2.0	Jan. °5	82	50	53	76	11.6	SE	66	NNW	June 10	--	5.6	124	107	134	91	13	65	40	33	30	180	16
Topeka CO	62.9	43.1	53.0	103	July 21	-9	Feb. 1	5501	50.84	4.32	July 11-12	AP 12.1	AP 3.5	AP Dec.8	AP 81	AP 86	AP 63	AP 65	AP 10.4	AP S	AP 61	AP S	AP Dec3	AP 47	AP 6.5	AP 94	AP 86	AP 185	122	AP 4	AP 82	AP 11	33	35	117	8
Wichita	64.2	44.5	54.4	104	Aug. 30	-7	Feb. 1	5109	50.48	3.67	May 16-17	15.1	7.5	Nov. 5	76	82	60	60	14.1	S	50	NW	Mar. 23	63	5.7	120	93	152	107	3	70	17	35	24	110	4
KENTUCKY																																				
Lexington	65.3	44.4	54.9	97	Aug. 31	-15	Feb. 2	4890	54.46	2.98	Jan. 2-3	33.5	6.1	Feb. 1	79	81	57	67	10.5	SSW	--	---	----	--	6.2	99	104	162	147	12	52	16	36	18	105	4
Louisville	66.3	45.2	55.8	98	Aug. 31	-19	Feb. 2	4508	51.15	2.67	Jan. 13-14	27.8	7.3	Feb. 1	81	84	60	65	8.4	S	57	SW	May 22	56	6.5	86	104	175	135	10	48	6	46	17	93	3
LOUISIANA																																				
Baton Rouge	79.1	57.8	68.5	102	Aug. 13	13	Feb. 3	1561	39.69	3.32	Sept. 25	.1	.1	Feb. 1	84	88	55	65	7.5	SE	--	---	----	--	5.3	121	133	111	91	0	63	27	101	2	22	0
Lake Charles	79.2	58.6	68.9	104	Aug. 15	13	Feb. 2	1458	37.38	4.75	Mar. 27	.6	.5	Jan. 31	89	91	59	71	10.0	S	--	---	----	--	5.6	109	129	127	97	0	64	38	105	4	22	0
New Orleans CO	79.2	62.6	70.9	99	Aug. 14	20	Feb. 2	1120	51.03	5.00	Mar. 28-29	T	T	Feb. 1	82	85	60	67	6.5	---	25	NE	Aug. 16	59	5.1	114	160	91	114	0	82	18	97	1	6	0
Shreveport	77.5	55.1	66.3	106	Aug. 17	2	Feb. 2	2171	37.75	2.32	Dec. 7-8	4.4	3.6	Jan. 31	79	87	57	60	9.8	SSE	59	E	Sept. 4	71	5.2	138	103	124	104	1	62	15	104	4	37	0
MAINE																																				
Caribou	48.5	29.8	39.2	87	Sept. 13	-32	Jan. 31	9414	40.88	2.82	July 5-6	111.8	14.7	Nov. 26-27	83	81	63	75	11.2	S	55	WNW	Dec. 19	--	7.3	53	93	219	168	36	14	34	0	90	187	37
Eastport CO	51.6	37.3	44.5	82	Sept 13	-14	Jan. 31	7403	52.09	2.26	Nov. 7-8	93.7	11.4	Feb. 4	--	--	--	--	10.2	---	57	S	Feb. 7	51	6.8	75	101	189	159	23	14	84	0	45	122	9
Portland	55.8	35.8	45.8	91	July 16	-13	Dec. 28	7150	56.04	3.47	Mar. 31	71.4	10.4	Dec. 14-15	87	83	64	80	8.7	N	54	S	Feb. 7	55	6.5	83	103	179	150	19	14	59	2	36	155	14
MARYLAND																																				
Baltimore CO	65.5	49.3	57.4	96	Aug. 16	12	Feb. °8	4074	46.93	2.82	Sept. 14	AP 8.6	AP 4.2	Dec. 14	AP 78	AP 78	AP 54	AP 65	AP 10.7	AP S	AP 72	AP E	Mar. 14	AP 47	AP 6.0	AP 101	AP 127	AP 137	AP 111	AP 4	AP 31	AP 36	25	9	65	0

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
MARYLAND (Cont'd.)																																				
Frederick	66.3	43.1	54.7	96	June °4	0	Dec. 20	4800	39.94	2.56	June 10	16.8	6.0	Dec. 15	--	--	58	--	----	---	--	---	----	--	---	---	---	---	126	5	17	11	37	11	110	1
MASSACHUSETTS																																				
Blue Hill Obs.	58.6	40.9	48.9	90	May °16	-1	Jan. 31	6221	50.93	2.31	May 23-24	48.8	9.7	Feb. 3-4	82	80	60	74	15.0	WNW	65	SSE	Feb. 7	48	6.6	81	114	170	148	14	24	110	2	26	111	2
Boston	60.1	44.2	52.2	92	July 16	1	Jan. 31	5250	46.97	2.07	May 23-24	35.4	6.6	Jan. °7-8	74	73	57	67	12.3	SW	56	SW	Nov. 3	55	6.5	83	106	176	141	12	19	23	6	20	83	0
Nantucket	57.8	44.1	51.0	84	June 25	11	Feb. 9	5334	40.13	2.61	Oct. 4-5	26.9	15.9	Feb. 3-4	86	82	71	84	11.5	SW	52	NE	Feb. 4	49	6.8	74	102	189	124	7	22	98	0	12	80	0
Pittsfield	55.2	35.2	45.2	85	July °16	-12	Dec. 20	7307	47.18	2.33	Oct. 2-3	68.4	8.2	Dec. 18	--	--	--	--	----	---	--	---	----	--	6.9	64	112	189	151	20	25	57	0	49	158	8
MICHIGAN																																				
Alpena CO	50.3	35.6	43.0	87	May °15	-15	Jan. 30	8072	34.73	2.28	July 3-4	103.1	10.6	Mar. 23-24	82	81	68	74	10.4	---	45	S	Sept. 26	54	6.9	70	96	199	165	30	28	25	0	74	152	15
Detroit WR AP	58.0	39.2	48.6	95	Aug. 31	-9	Dec. 17	6486	37.56	3.17	July 21-22	59.5	8.0	Nov. 6	80	81	58	66	10.6	SW	60	W	June 1	--	6.8	78	92	195	126	15	33	26	5	47	133	9
Detroit	57.6	40.5	49.1	95	Aug. 31	-4	Jan. 30	6341	37.78	2.61	Oct. 23-24	58.8	6.8	Dec. 17-18	79	79	60	67	9.6	NW	56	SW	June 1	52	6.6	85	94	186	141	13	29	7	7	45	118	7
Escanaba CO	48.2	33.8	41.0	87	July 25	-22	Jan. 30	8757	37.18	3.50	July 26-27	58.5	9.3	Dec. 19-20	80	81	67	73	10.8	---	47	N	Nov. 7	53	6.6	82	99	184	143	17	32	29	0	86	157	24
Grand Rapids CO	56.3	40.5	48.4	90	June °18	-3	Jan. 30	6520	40.73	3.31	June 19	127.2	10.8	Nov. 6-7	AP 84	AP 84	AP 63	AP 71	AP 9.3	AP W	AP 47	AP W	AP Oct. 30	AP 50	AP 7.3	AP 58	AP 91	AP 216	150	31	39	9	2	56	124	2
Lansing	55.4	37.4	46.4	91	July 26	-14	Jan. 30	7068	31.70	1.98	Oct. 23-24	66.9	11.0	Nov. 6-7	83	83	63	72	12.4	W	52	NW	Mar. 24	49	[illegible].7	82	99	184	155	19	34	26	3	65	148	11
Marquette CO	47.8	33.6	40.7	91	July 29	-17	Jan. 30	8934	41.59	2.34	Aug. 30-31	113.8	11.7	Apr. 13	76	77	66	70	8.1	---	47	NW	Oct. 30	49	7.6	44	93	228	158	34	37	37	2	100	161	18
Muskegon	54.0	37.7	45.9	88	Sept. 12	-6	Jan. 30	7136	34.47	1.87	Nov. 13	91.4	6.5	Nov. °3-4	83	82	67	73	9.5	WNW	45	SW	Nov. 14	--	7.4	59	84	222	150	33	30	24	0	64	148	4
Sault Ste. Marie	48.1	30.6	39.4	84	July 26	-24	Feb. 9	9285	35.38	1.59	Oct. 17-18	109.4	10.9	Feb. 11	84	84	67	75	9.0	NW	47	W	Oct. 31	42	7.3	60	90	215	156	35	30	40	0	92	175	29
MINNESOTA																																				
Duluth CO	45.1	27.9	36.5	88	July 25	-33	Jan. 29	10391	38.62	2.78	June 19-20	63.3	8.0	Mar. 3	AP 83	AP 84	AP 68	AP 72	AP 11.5	AP NW	AP 49	AP W	AP Apr. 22	AP 50	AP 7.0	AP 68	AP 98	AP 199	147	19	AP 33	AP 66	0	116	189	52
International Falls	44.8	24.0	34.4	91	July °24	-41	Jan. 29	11128	28.04	2.23	Aug. 30-31	84.5	9.1	Mar. 30-31	84	85	68	72	----	---	--	---	----	--	6.9	75	80	210	149	24	21	16	3	123	205	79
Minneapolis	50.7	33.4	42.1	91	July 15	-29	Jan. 30	8734	34.60	2.97	July 20-21	86.4	9.6	Mar. 18	79	83	63	65	10.7	SE	92	W	July 20	49	6.5	89	88	188	130	24	32	21	4	103	160	46
Rochester	51.0	31.3	41.2	92	July 7	-40	Jan. 30	8965	40.39	4.51	July 20-21	76.7	10.0	Mar. 17-18	82	83	64	70	9.8	WNW	--	---	----	--	---	66	91	208	138	24	40	27	2	99	166	52
St. Cloud	49.0	28.4	38.7	92	July 15	-40	Jan. 30	9731	37.26	2.26	July 7	72.9	12.2	Feb28-Mar.1	83	85	67	70	7.[illegible]	WNW	30	WNW	Feb. °6	--	6.6	93	81	191	139	18	34	23	6	107	179	66
St. Paul	50.9	33.3	42.1	92	July 15	-32	Jan. 30	8682	37.20	3.03	July 20-21	[illegible]0.4	10.5	Mar. 17-18	79	82	62	65	9.5	SSE	65	SE	May 1	--	6.7	83	84	198	140	21	39	29	4	97	160	42
MISSISSIPPI																																				
Jackson	78.3	54.7	66.5	103	Aug. °31	1	Feb. 2	2141	42.25	3.69	Jan. 31	4.2	1.8	Jan. °31	79	86	52	59	8.4	SSE	59	NW	Dec. 14	63	5.1	134	113	118	106	2	62	4	113	3	43	0
Meridian	78.5	52.8	65.7	104	Aug. 31	8	Feb. 2	2233	42.47	4.87	Mar. 27-28	.6	.6	Feb. 1	86	90	52	62	6.3	NW	--	---	----	--	5.2	139	113	113	89	1	50	18	114	1	51	0
Vicksburg CO	76.0	56.6	66.3	100	Aug. 31	6	Feb. 2	2024	54.55	9.97	Mar. 27-28	3.7	2.5	Feb. 1	--	--	--	--	8.7	---	37	SW	June 10	64	5.6	107	130	128	103	1	52	9	89	4	30	0
MISSOURI																																				
Columbia	62.6	43.0	52.8	97	Aug. 29	-9	Feb. 2	5443	46.17	2.13	Aug. 15	28.3	7.5	Nov. 5-6	79	85	62	66	10.6	S	58	NW	June 19	57	6.4	89	95	181	134	9	84	20	21	38	114	8
Kansas City	62.6	44.3	53.5	100	Aug. 6	-6	Feb. 1	5368	46.22	2.24	July 10-11	11.7	3.2	Jan. 30-31	75	80	61	61	9.0	SSW	65	NW	Aug. 31	54	6.4	92	94	179	132	6	76	12	29	34	113	6
St. Joseph	61.3	41.3	51.3	97	Aug. 30	-10	Feb. 1	5988	53.99	4.03	June 20-21	19.4	4.1	Dec. 8	80	84	62	65	10.7	SSE	59	S	Dec. 6	52	6.2	99	92	174	131	6	71	25	25	45	137	8
St. Louis CO	63.4	46.8	55.1	99	Aug. 30	-4	Feb. 2	4931	38.65	1.75	June 25-26	27.6	12.4	Nov. 5-6	AP 77	AP 82	AP 60	AP 64	11.5	S	56	SW	Nov. °13	60	6.3	94	103	168	132	7	53	10	30	27	90	4
Springfield	64.4	44.0	54.2	100	Aug. 31	-11	Feb. 2	5001	50.19	3.80	July 3-4	30.1	12.5	Nov. 5-6	83	86	64	67	13.2	SSE	57	S	June 21	55	6.5	86	97	182	128	8	72	28	23	27	105	4
MONTANA																																				
Billings	54.3	32.2	43.3	99	July 18	-22	Jan. 28	8243	11.99	.90	May 31	76.0	7.2	Feb. 26-27	63	69	53	49	10.3	WSW	58	NW	Jan. 22	58	6.1	84	123	158	112	33	33	24	20	64	180	30
Butte	49.8	21.8	35.8	94	July 18	-46	Jan. 29	10604	12.14	.75	Apr. 29-30	95.6	10.8	Apr. 29-30	73	80	53	52	8.7	NW	*50	*NW	Mar. °15	--	6.9	75	84	206	122	36	29	3	4	86	241	54
Glasgow CO	50.4	25.3	37.9	108	July 28	-33	Feb. 1	10198	13.28	.78	Apr. 18-19	58.3	8.0	°Jan. 25-26	--	--	--	--	----	---	--	---	----	--	6.3	96	92	177	112	17	24	11	21	102	200	75

See reference notes at end of table.

Table 10–Continued

ANNUAL CLIMATOLOGICAL DATA

YEAR 1951

State and Station	Temperature: Averages: Daily maximum	Daily minimum	Annual	Extremes: Highest	Date	Lowest	Date	Degree days	Precipitation: Total	Greatest in 24 hrs.	Date	Snow, Sleet, Hail: Total	Greatest in 24 hrs.	Date	Relative humidity				Wind: Average hourly speed	Prevailing direction	Fastest mile: Speed	Direction	Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	Max temp: 90° and above	32° and below	Min. temp.: 32° and below	Zero and below
MONTANA (Cont'd.)																																				
Great Falls	50.9	30.0	40.5	96	July °27	-29	Mar. 8	9121	21.59	2.43	Apr30-May 1	84.2	11.0	Feb. 21	65	71	54	51	12.9	SW	73	W	Mar. °15	56	6.8	76	91	198	121	30	26	18	9	72	172	42
Havre CO	50.7	27.5	39.1	103	July 27	-30	Mar. 8	9657	17.04	1.43	May 14	52.9	4.5	Oct. 29	--	--	--	--	8.4	E	50	S	July 5	61	6.1	95	103	167	107	20	17	0	17	93	186	53
Helena	51.7	27.9	39.8	98	July 18	-27	Jan. 29	9277	12.03	1.25	Apr. 29-30	61.6	5.8	Dec. 22	69	77	57	53	6.8	W	51	W	Sept. 25	62	6.8	77	78	210	109	20	30	6	14	71	185	34
Kalispell	51.8	29.7	40.8	95	Aug. 2	-22	Dec. 26	8872	21.87	1.74	Apr30-May 1	115.2	15.4	Dec. 21-22	76	81	60	57	7.9	S	*62	*NNE	Jan. 26	--	7.0	79	68	218	150	37	25	40	11	60	186	26
Miles City	53.6	29.2	41.4	103	July 24	-31	Dec. 20	9000	14.91	1.10	July 2	37.0	----	-----	--	--	--	--	9.5	SSE	--	---	----	--	6.0	---	---	---	102	11	34	---	25	77	193	43
Missoula	54.1	30.7	42.4	98	July 27	-20	Dec. 26	8348	15.02	1.65	Apr. 29-30	70.1	5.1	Dec. 28-29	73	81	58	52	5.7	NW	47	NW	Mar. 15	47	7.1	77	62	226	133	22	25	20	18	64	188	15
NEBRASKA																																				
Grand Island	58.2	36.2	47.2	98	Aug. 2	-17	Feb. 1	7028	27.36	2.57	May 17	25.3	7.9	Dec. 13-14	79	83	58	61	12.9	SSE	74	SSW	Apr. 30	--	6.2	109	94	162	118	9	66	12	20	54	160	19
Lincoln CO	58.5	39.6	49.1	102	Aug. 5	-13	Feb. 1	6586	40.07	4.65	June 1-2	25.4	6.3	Dec. 13-14	AP 81	AP 84	AP 61	AP 65	9.2	---	60	N	July 27	54	AP 6.3	AP 91	AP 105	AP 169	123	9	65	9	19	53	138	18
Norfolk	55.9	35.1	45.5	99	Aug. 5	-17	Dec. 15	7645	28.[illegible]1	2.11	Aug. 14	28.3	5.0	Mar. 17	82	85	60	65	12.9	NNW	46	NNW	Nov. 3	--	6.1	100	96	169	111	10	59	17	18	67	169	28
North Platte	58.9	33.9	46.4	98	July 20	-21	Feb. 1	7176	33.44	2.78	May 14-15	15.9	3.3	Dec. 13-14	79	84	54	56	10.3	SE	59	N	Mar. 28	53	[illegible].1	97	114	154	107	6	75	10	15	42	184	14
Omaha	57.6	38.2	47.9	99	Aug. 30	-12	Dec. 15	6982	40.60	2.26	Aug. 14	35.6	9.9	Dec. 13-14	81	84	63	65	11.2	SSE	56	NW	Nov. 3	52	6.4	92	99	174	117	13	61	30	19	55	149	27
Scottsbluff	59.9	32.1	46.0	100	July 7	-21	Feb. 1	7274	17.96	3.28	Sept. 2-3	26.3	3.6	Mar. 19-20	69	76	46	49	8.9	NW	[illegible]0	NW	May 30	--	5.8	106	118	141	102	12	64	12	21	32	187	17
Valentine CO	55.6	32.0	43.8	99	July 19	-19	Jan. °28	8075	14.43	2.2[illegible]	Aug. 1	34.8	7.5	Dec. 6	--	--	--	--	8.9	---	50	SE	Apr. 30	63	6.3	77	129	159	104	9	58	---	17	61	178	29
NEVADA																																				
Elko	61.6	28.4	45.0	100	July 18	-21	Dec. 9	7461	7.97	1.27	Jan. 18-19	56.5	16.7	Jan. 18-19	64	74	47	43	6.7	SW	--	---	----	--	5.1	143	93	129	[illegible]8	13	21	7	31	32	220	16
Ely	59.9	26.8	43.4	94	July 18	-22	Dec. 9	7920	7.29	.76	Dec. 28-29	34.6	8.2	Nov. 21	--	--	--	--	11.2	S	60	SW	May 26	64	5.4	127	99	139	76	11	34	1	13	30	216	20
Las Vegas	78.9	51.1	65.0	112	June 28	21	Dec. 9	2771	2.[illegible]1	.98	Sept. 28	T	T	Jan. °29	31	40	23	19	6.9	SW	--	---	----	83	3.5	213	67	85	24	0	15	0	131	0	61	0
Reno	66.4	32.1	49.3	98	Aug. 18	-3	Jan. 20	6003	8.12	.80	Jan. 17-18	28.2	8.3	Jan. 18-19	61	76	41	33	5.4	WNW	68	S	Mar. 5	77	4.4	172	92	101	51	9	15	9	50	9	191	1
Winnemucca	64.5	31.7	48.1	100	July °18	-6	Dec. 9	6483	8.63	1.[illegible]4	Oct. 23-24	26.2	5.5	Dec. 3	54	63	42	34	8.4	S	61	N	May 20	75	5.2	141	76	148	67	8	10	1	49	22	194	5
NEW HAMPSHIRE																																				
Concord	57.5	34.8	46.2	91	May 16	-22	Dec. 17	7111	49.27	2.78	Nov. 2-3	53.7	7.6	Dec. 14-15	83	80	57	72	5.4	NW	40	W	Apr. 26	51	6.7	79	94	192	145	18	19	81	4	39	157	16
NEW JERSEY																																				
Atlantic City CO	61.4	49.0	55.2	92	July °23	12	Dec. 17	4369	38.63	3.15	Nov30-Dec.1	4.3	1.6	Dec. 14	--	78	67	75	15.7	---	65	S	Mar. 30	63	6.0	98	112	155	117	2	27	27	3	10	66	0
Newark	63.2	45.5	54.4	96	July 27	6	Dec. 17	4780	48.59	3.36	July 27-28	12.4	4.2	Dec. 14	75	74	54	64	10.1	SW	*50	W	Apr. 15	--	6.4	81	116	168	117	3	25	22	18	15	85	0
Trenton CO	62.9	45.7	54.3	94	July 27	4	Dec. 17	4755	43.35	2.20	Oct. 7	10.9	6.4	Dec. 14	--	--	--	--	8.9	---	60	NW	Oct. 7	62	6.4	85	113	167	110	2	27	---	8	15	84	0
NEW MEXICO																																				
Albuquerque	70.5	43.9	57.2	102	July 9	-5	Feb. 1	430[illegible]	5.38	.76	Jul31-Aug.1	10.0	4.1	Jan. 30-31	40	51	32	26	[illegible].7	SE	61	SE	Aug. 15	76	4.2	183	108	74	41	4	37	4	75	5	110	2
Clayton	66.7	36.9	51.8	99	Aug. 7	-17	Feb. 1	5499	14.6[illegible]	2.14	May 15	17.2	4.9	Jan. 1-2	71	74	45	49	----	---	--	---	----	--	4.7	160	105	100	62	7	59	24	38	18	155	7
Raton	63.7	31.5	47.6	96	June 29	-22	Feb. 1	6662	14.[illegible]4	1.76	Aug. 24	39.9	7.0	Jan. 12-13	--	69	37	39	----	---	--	---	----	--	5.1	127	129	109	76	12	73	4	24	22	192	11
Roswell	76.8	43.6	60.2	108	July 8	-8	Feb. 1	3583	6.[illegible]9	.93	Aug. 21-22	8.1	5.5	Dec. 7-8	48	61	32	27	9.6	SSE	61	SW	Apr. 29	77	3.8	195	93	77	43	3	35	1	112	7	116	2
NEW YORK																																				
Albany	57.5	37.9	47.7	90	July 26	-19	Dec. 20	6679	45.21	2.[illegible]5	Sept. 14-15	56.0	8.8	Dec. 14-15	82	80	58	71	8.2	WNW	52	NW	Jan. 21	51	6.9	55	122	188	149	17	29	36	2	42	139	12
Bear Mountain CO	55.9	41.7	48.8	85	May °16	-7	Dec. 17	6337	59.02	5.50	Mar. 29-30	33.3	8.5	Dec. 14-15	--	--	--	--	----	---	--	---	----	--	---	91	99	175	120	10	27	93	0	36	119	3
Binghamton CO	58.7	39.3	49.0	92	Aug. °9	-5	Feb. °10	6248	35.56	1.80	July 13	59.7	9.3	Jan. 7-8	AP 82	AP 82	AP 61	AP 71	AP 9.9	AP WSW	‡57	‡SE	Nov. ‡7	‡47	‡ 7.4	AP 47	AP 99	AP 219	AP 158	AP 18	AP 37	AP 46	AP 7	AP 37	AP 128	AP 3
Buffalo	56.8	39.7	48.3	9[illegible]	Aug. 31	-5	Feb. 3	6477	37.75	1.67	Nov. 6-7	83.2	9.7	Dec. 17-18	80	80	61	72	13.4	SW	66	SW	Mar. 24	49	7.1	[illegible]1	105	199	164	25	31	20	3	52	120	2
New York CO	62.0	47.2	54.6	9[illegible]	July 27	8	Dec. 17	4610	45.24	3.36	July 27-28	10.9	4.3	Jan. 31	74	60	64	71	13.9	NW	77	NW	Dec. 19	61	6.1	101	109	155	109	2	23	19	2	14	77	0

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
NEW YORK (Cont'd.)																																				
New York	62.9	47.9	55.4	95	July 27	9	Dec. 17	4465	51.40	2.73	Mar. 29-30	13.1	3.9	Jan. 31	72	71	55	65	12.7	---	59	NW	Feb. 8	--	6.4	86	101	178	117	3	21	10	11	13	73	0
Oswego CO	54.8	40.6	47.7	88	Sept 13	-6	Feb. 9	6586	38.11	1.70	July 4-5	84.6	12.4	Jan. 25-26	--	--	--	--	9.4	---	35	W	Jan. 21	48	6.7	84	92	189	182	22	34	9	0	45	114	3
Rochester	57.4	38.8	48.1	94	Sept 13	-11	Feb. 10	6554	36.21	1.77	June 10-11	86.0	6.6	Nov. 2-3	83	83	62	71	10.3	SW	57	W	Jan. 21	45	6.7	72	113	180	170	28	27	7	6	46	128	5
Syracuse	57.0	38.9	48.0	90	Aug. 31	-12	Feb. 9	6582	44.41	1.64	July 18-19	104.3	8.8	Feb. 8	80	79	62	70	9.8	W	47	NW	July 19	46	7.1	66	96	203	178	31	34	9	1	45	132	10
NORTH CAROLINA																																				
Asheville CO	67.7	44.9	56.3	95	June 3	4	Feb. 3	4092	35.21	1.81	Dec. 3-4	4.6	1.5	Feb. 9	AP 90	AP 88	AP 55	AP 74	7.8	†NW	37	†NW	June 26	[illegible]2	5.7	101	131	133	138	1	52	69	21	8	87	0
Charlotte	71.9	49.6	60.8	100	Aug. 8	12	Feb. 8	3141	34.46	2.35	Dec. 20-21	.5	.4	Feb. 9	7[illegible]	81	51	[illegible]3	7.0	SW	36	SW	Feb. 1	69	5.8	104	117	144	102	0	44	30	66	3	67	0
Greensboro	70.0	46.4	58.2	100	June 2	10	Feb. °4	3786	37.17	3.21	June 17-18	.6	.5	Feb. 9-10	83	82	52	67	8.2	SW	43	SW	Feb. 1	[illegible]2	5.7	125	98	142	119	0	34	31	49	6	95	0
Hatteras	68.9	57.4	63.2	89	Aug. 18	22	Feb. 8	2305	48.05	3.62	Nov. 6-7	5.9	5.9	Feb. 3	84	82	73	82	12.2	NNE	47	W	Nov. °3	64	5.7	117	97	151	126	1	63	7	0	0	12	0
Raleigh CO	72.3	50.3	61.3	101	June °24	14	Dec. 16	3020	35.28	4.27	July 19	1.5	1.5	Feb. 9	AP 80	AP 81	AP 50	AP 68	AP 7.3	AP SW	32	SW	Apr. 12	56	5.5	105	148	112	114	1	31	24	62	4	62	0
Wilmington CO	73.2	55.1	64.2	96	July 13	19	Feb. °4	2179	52.50	4.42	Nov. 6-7	3.5	3.0	Feb. 3	AP 87	AP 85	AP 59	AP 79	8.8	†SW	49	W	Mar. 30	53	5.9	94	133	138	104	2	43	21	31	1	31	0
Winston-Salem	69.7	48.2	59.0	101	June 2	10	Dec. 16	3651	36.92	3.00	Aug. 7	1.5	.7	Feb. 9	72	72	48	59	9.9	NE	--	---	----	--	8.6	133	114	118	124	0	32	23	49	4	80	0
NORTH DAKOTA																																				
Bismarck	48.5	25.1	36.8	99	July 14	-37	Jan. 29	10471	16.62	2.06	Aug. 29-30	41.0	8.7	Feb. 27-28	81	84	64	65	9.7	NW	57	W	Mar. 5	60	6.5	81	103	181	117	11	36	19	9	107	198	80
Devils Lake CO	45.1	25.0	35.1	97	July 24	-36	Jan. 29	11040	13.40	1.45	July 29	32.7	4.0	Nov. 14	--	82	63	64	8.8	NW	34	NW	May °29	57	[illegible].0	103	101	161	107	10	20	18	7	130	196	82
Fargo	47.3	27.6	37.5	94	Aug. 1	-36	Jan. 29	10206	21.25	1.86	July 3	67.6	11.2	Feb28-Mar.1	80	82	64	66	12.8	SSE	59	N	Aug. 1	56	6.2	102	91	172	117	18	22	23	5	119	190	71
Williston	47.4	26.5	37.0	100	July 27	-34	Jan. 29	1046[illegible]	12.13	1.96	Sept. 3-4	38.2	6.[illegible]	Feb. 27-28	75	[illegible]0	59	5[illegible]	7.2	---	42	W	Mar. 5	62	6.7	83	93	189	90	14	19	14	13	109	198	71
OHIO																																				
Akron	58.5	38.6	48.6	9	Aug. 29	-11	Feb. °3	6408	43.35	1.52	Sept. 13	67.9	8.5	°Mar. 13-14	83	84	61	72	9.4	S	--	---	----	--	6.7	78	93	194	154	16	40	27	4	42	139	8
Cincinnati CO	64.5	44.6	54.6	103	Aug. 31	-9	Feb. 2	4954	39.64	1.94	Oct. 23-24	36.9	9.6	Jan31-Feb.1	AP 78	AP 81	AP 58	AP 64	7.8	†S	55	WNW	Jan. 20	50	AP 6.5	AP 94	AP 91	AP 180	146	11	36	AP 15	30	22	98	4
Cleveland	60.0	40.9	50.5	95	Aug. 30	-9	Dec. 16	5943	44.22	1.66	Sept. 13	84.1	9.1	Nov. 18	81	82	61	69	11.4	S	65	W	Apr. 28	49	6.6	83	93	189	152	30	26	5	15	41	112	6
††Columbus	62.2	42.3	52.3	98	Aug. 31	-14	Dec. 16	5487	37.27	1.29	Nov. 6-7	27.4	6.6	Jan31-Feb.1	AP 81	AP 82	AP 58	AP 67	8.6	SE	44	SW	Mar. 29	55	6.5	86	104	175	129	7	AP 34	AP 13	20	31	106	7
Dayton	60.6	41.9	51.3	100	Aug. 31	-16	Feb. 2	5815	37.19	2.73	Feb. 20-21	43.3	7.7	Feb. 1	[illegible]0	83	60	67	11.4	S	56	SW	Mar. °26	58	6.7	76	104	185	139	11	41	20	10	35	118	8
Sandusky CO	59.2	43.2	51.2	99	Aug. 31	-7	Feb. 2	5784	34.73	1.42	Nov. 6-7	49.1	7.1	Mar. 19	--	--	--	--	8.6	---	40	S	Apr. 28	62	6.3	92	107	166	141	16	29	8	12	37	99	5
Toledo	58.4	39.7	49.1	101	Aug. 31	-11	Feb. 2	6351	36.18	2.38	June 12-13	60.2	9.9	Dec. 24-25	83	84	62	71	11.1	SSW	52	SW	Mar. 3	45	6.8	73	95	197	129	16	33	19	8	45	120	10
Youngstown	58.7	38.6	48.7	91	Aug. 30	-11	Feb. 3	6370	41.86	1.67	Sept. 13-14	68.0	9.4	Mar. 13-14	82	83	61	72	9.7	SW	*50	WSW	Apr. 29	--	6.6	76	109	180	166	21	36	25	2	42	135	7
OKLAHOMA																																				
Oklahoma City CO	71.0	49.3	60.2	107	Aug. 6	-2	Feb. 1	3729	33.82	2.99	May 16-17	AP 12.7	AP 5.1	AP Feb. 13-14	AP 72	AP 79	AP 56	AP 55	AP 16.0	AP S	AP 87	AP NNW	AP June 20	AP --	AP 5.1	AP 138	AP 104	AP 123	88	AP 4	AP 57	AP 12	73	10	79	1
Tulsa	70.1	48.2	59.2	106	Aug. 6	0	Feb. 1	3898	42.98	3.95	Oct. 5-6	11.9	5.3	Feb. 13-14	75	81	55	58	12.0	S	56	W	Aug. 10	65	5.6	123	85	157	108	5	70	10	67	1[illegible]	84	1
OREGON																																				
Baker CO	57.7	33.2	45.5	99	July 17	-14	Jan. 29	7315	8.61	.61	May 11-12	55.9	5.0	Jan. 13-14	--	--	--	--	6.3	SE	47	SW	Jan. 2	64	5.7	126	87	152	89	23	9	2	24	37	172	[illegible]
Burns CO	59.4	32.5	46.0	97	July 23	-9	Jan. 30	7190	12.55	.97	Apr. 27-28	90.4	6.6	Dec. 26-27	61	69	51	44	----	---	--	---	----	--	5.2	144	81	140	84	2[illegible]	6	7	27	33	175	10
Eugene	64.7	40.9	52.8	102	July 11	14	Jan. 30	4610	42.97	1.62	Jan. 16-17	16.1	4.[illegible]	Mar. 5	83	91	69	57	8.0	N	--	---	----	--	6.1	108	80	177	127	7	4	47	19	2	56	0
Meacham	52.8	33.3	43.1	94	July 23	-11	Jan. °28	[illegible]043	31.98	1.70	Oct. 2-3	161.4	17.2	Mar. 3-4	--	--	59	57	----	---	*36	*WSW	Jan. °15	--	6.6	97	77	191	132	41	11	22	2	58	16[illegible]	4
Medford	67.7	41.1	54.4	100	July °11	15	Jan. 30	4509	20.00	2.00	Feb. 3-4	6.6	4.1	Mar. 3	68	82	62	45	5.6	N	*42	*SSW	Mar. 8	--	5.8	129	64	172	97	2	2	42	[illegible]2	5	84	0
Pendleton	62.1	41.1	51.6	99	July 23	-4	Jan. 29	5435	11.86	.81	Apr. 28	17.2	3.0	Jan. 27	63	69	55	49	9.1	SE	--	---	----	--	5.6	131	75	159	94	5	9	23	27	19	104	1
Portland CO	62.5	46.4	54.5	97	June 29	18	Jan. 28	4194	45.17	2.15	Oct. 22-23	10.6	4.3	Mar. 8	AP 77	AP 86	AP 71	AP 59	AP 6.5	AP NW	AP 57	AP S	AP Dec4	AP 51	AP 6.7	AP 87	AP 74	AP 204	129	3	AP 3	AP 35	11	3	25	0

See reference notes at end of table.

Table 10—Continued

ANNUAL CLIMATOLOGICAL DATA

YEAR 1951

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max temp		Min temp	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
OREGON (Cont'd.)																																				
Roseburg CO	66.0	44.1	55.1	101	July 11	16	Jan. 30	4005	37.54	1.96	Feb. °3-4	19.4	5.0	Mar. 4-5	--	--	69	58	4.4	---	40	SW	Dec. 4	54	6.3	107	71	187	124	8	4	37	22	0	42	0
Salem	63.6	40.7	52.2	99	June 29	16	Jan. 30	4811	47.47	2.07	Oct. 1-2	11.2	4.4	Mar. 5	82	90	69	57	7.3	S	*42	*S	Dec. 18	--	6.4	102	69	194	140	4	3	33	17	1	61	0
Sexton Summit CO	57.3	39.7	48.5	88	June °29	12	Jan. 29	6193	39.69	1.83	Feb. 3-4	117.0	10.4	Jan. 18-19	--	--	--	--	----	---	--	---	----	--	5.7	140	54	171	121	34	5	143	0	27	108	0
Troutdale	62.8	42.7	52.8	99	Aug. 21	19	Jan. 28	4671	49.29	2.11	Oct. 22-23	16.7	7.6	Mar. 8	--	--	70	--	----	---	--	---	----	--	6.7	88	80	197	148	4	5	21	15	7	48	0
PENNSYLVANIA																																				
Allentown	60.8	41.2	51.0	92	May 17	-2	Dec. 20	5671	54.58	2.86	June 22-23	23.6	5.5	Dec. 4	83	82	59	71	7.7	W	*55	W	July 19	--	6.3	80	121	164	122	5	39	30	5	24	118	3
Curwensville	55.5	35.6	45.6	88	Aug. 30	-13	Dec. 17	7227	50.40	1.55	Mar. 30	110.0	9.8	Dec. 18-19	84	83	64	78	10.8	WNW	*36	ESE	Mar. °13	--	7.3	58	94	213	177	32	46	77	0	59	153	8
Erie CO	57.4	43.4	50.4	92	Aug. 31	-2	Feb. 3	5837	38.93	1.57	Nov. 6-7	74.7	10.7	Jan31-Feb.1	AP 80	AP 80	AP 67	AP 75	8.6	---	38	SW	Nov. 4	45	6.4	93	97	175	176	21	31	3	1	39	101	2
Harrisburg	62.1	43.8	53.0	94	July °27	0	Dec. 17	5223	33.55	1.36	Sept. 1-2	29.1	9.0	Dec. 14	75	76	54	63	7.6	WNW	42	NW	Dec. 15	57	6.3	89	106	170	117	5	31	13	20	16	102	1
Park Place	55.8	38.8	47.3	87	July 16	-4	Feb. °3	6746	54.61	3.92	July 28	49.4	8.5	Dec. 18	--	82	64	--	----	---	--	---	----	--	6.6	87	95	183	143	14	22	91	0	55	138	4
Philadelphia CO	64.3	48.1	56.2	94	July 27	10	Dec. 17	4301	41.96	2.17	Oct. 7	8.7	5.0	Dec. 14	AP 78	AP 77	AP 53	AP 66	7.9	‡NW	56	SE	Nov. 7	60	6.2	86	127	152	104	2	23	18	12	12	65	0
Pittsburgh	61.4	43.2	52.3	92	June 3	-5	Dec. 16	5401	45.15	2.34	June 24-25	49.7	8.6	Jan. 6-7	74	78	56	62	10.0	S	43	W	Dec. 15	49	6.9	65	109	191	156	17	33	22	10	26	107	3
Reading CO	63.3	45.5	54.4	95	July 27	3	Dec. 17	4807	44.88	2.54	Nov. 7	20.3	7.0	Dec. 18	--	76	--	--	10.6	‡S	66	W	July 19	54	6.5	82	103	180	119	5	31	3	18	17	82	0
Scranton CO	59.5	41.6	50.6	91	Aug. 30	0	Dec. 17	5787	39.21	2.10	Oct. 7-8	33.4	8.3	Dec. 18	--	--	59	--	6.3	---	38	NW	Feb. 8	45	6.4	86	122	157	137	12	31	4	6	27	109	1
Williamsport	60.8	39.9	50.4	96	Aug. 30	-11	Dec. 17	5953	34.81	1.61	Nov. 7	41.5	8.1	Dec. 18	79	79	54	65	8.0	---	*78	SSW	July 10	--	6.7	70	119	176	126	13	28	42	20	26	128	5
RHODE ISLAND																																				
Block Island	58.3	45.3	51.8	87	July 27	10	Jan. 31	5142	38.65	1.94	Aug. 7-8	17.4	6.5	Feb. 3-4	--	82	69	--	----	---	--	---	----	--	6.4	80	119	166	111	6	19	54	0	13	76	0
Providence CO	61.8	43.9	52.9	92	June °1	4	Jan. 31	5039	49.02	2.30	Nov. 2-3	24.5	7.8	Feb. 3-4	AP 80	AP 78	AP 57	AP 71	AP 9.1	AP NW	AP 45	AP NW	AP Feb. °8	AP 60	AP 6.4	AP 88	AP 109	AP 168	120	10	17	AP 46	9	18	86	0
SOUTH CAROLINA																																				
Charleston CO	73.5	59.1	66.3	95	Aug. 9	26	Feb. 2	1753	38.23	3.48	Sept. 6	T	T	May °4	AP 88	AP 86	AP 55	AP 75	9.9	AP SW	49	NW	June 9	63	5.5	123	97	145	91	0	78	20	34	0	13	0
Columbia CO	74.8	53.9	64.4	102	June 3	19	Dec. 16	2332	29.81	1.58	Apr. 7-8	T	T	Feb. °9	AP 82	AP 84	AP 49	AP 65	7.7	AP SW	40	W	June 8	64	5.2	140	102	123	105	0	44	16	74	0	37	0
Florence	75.7	51.9	63.8	100	July 13	17	Dec. 17	2401	42.18	4.65	July 1	T	T	Feb. °9	82	83	48	67	7.6	SW	--	---	----	--	5.8	106	138	121	104	0	44	32	76	0	48	0
Greenville	71.0	51.0	61.0	100	June 3	15	Feb. 3	3134	49.76	6.20	Sept. 5-6	.5	.5	Feb. 9-10	76	79	52	64	7.6	NNE	60	N	July 15	67	5.7	114	111	140	128	0	47	25	59	3	59	0
Spartanburg	71.3	50.5	60.9	99	June 3	13	Feb. 3	3170	41.92	3.69	Sept. 22	.4	.4	Nov. 27	78	81	56	65	7.8	SW	*55	SW	Apr. 13	--	5.6	116	113	136	113	0	48	27	64	3	57	0
SOUTH DAKOTA																																				
Huron	52.3	30.5	41.4	98	July 26	-23	Jan. 29	8926	24.19	2.24	June 27	51.9	7.8	Mar. 2-3	82	85	62	64	11.4	SSE	68	SE	Apr. 30	60	6.6	74	109	182	103	19	41	18	12	84	184	48
Rapid City	55.9	30.9	43.4	104	July 19	-25	Jan. 29	8201	14.77	1.40	May31-June1	23.0	5.2	Mar. 2	71	74	52	54	11.4	NNW	65	NW	Aug. 1	56	6.1	86	119	160	98	7	57	8	20	58	190	32
Sioux Falls	52.8	31.5	42.2	95	July 20	-25	Dec. 27	8662	30.79	1.99	June 25	73.9	14.8	Mar. 2-3	82	84	63	67	10.7	NW	47	NW	Nov. 3	--	6.8	81	93	191	118	16	44	30	5	86	180	44
TENNESSEE																																				
Bristol	67.5	44.2	55.9	93	July 22	4	Feb. 3	4220	48.29	2.06	July 23	3.4	.7	Jan. 16	83	85	55	66	6.3	NE	*50	NW	May 3	--	6.0	101	111	153	155	0	52	61	16	9	100	0
Chattanooga	72.2	49.2	60.7	100	Sept 1	5	Feb. 2	3290	56.21	4.66	Mar. 28-29	1.0	1.0	Feb. 9	83	85	53	65	5.7	SSW	63	NW	May 2	52	5.9	106	113	146	127	1	71	33	76	1	68	0
Knoxville	70.4	48.4	59.4	100	Sept 1	5	Feb. 2	3572	52.73	2.69	Mar. 28-29	3.0	1.8	Feb. 9	82	85	56	65	7.8	NE	58	NW	June 22	48	6.0	95	127	143	140	1	58	22	60	13	75	0
Memphis	71.8	51.0	61.4	103	Aug. 31	-11	Feb. 2	3245	54.56	3.50	Jan. 2-3	6.3	3.7	Jan31-Feb.1	79	83	57	64	10.7	S	50	S	June °7	63	5.8	113	101	151	108	2	51	10	81	9	57	1
Nashville	70.0	48.5	59.3	101	Aug. 31	-13	Feb. 2	3777	58.39	3.88	Dec. 7-8	25.6	6.2	Mar. 12-13	83	87	58	65	7.1	S	57	W	June 22	49	6.2	93	117	155	129	9	62	14	66	10	74	3
TEXAS																																				
Abilene	78.4	52.5	65.5	104	July 20	1	Feb. 1	2552	14.83	2.18	May 17-18	4.0	3.5	Feb. 13-14	57	68	41	38	13.7	S	109	NW	June 10	--	4.6	160	93	112	51	2	43	3	124	6	57	0
Amarillo	70.9	42.8	56.9	103	July °21	-14	Feb. 1	4441	25.29	6.75	May 15-16	11.3	4.3	Dec. 7-8	64	71	43	43	13.6	S	56	SW	Apr. °24	66	4.4	161	103	101	66	3	49	11	78	14	120	4
Austin	80.5	57.3	68.9	105	July 19	7	Feb. 2	1675	28.98	3.82	June 3	1.6	1.0	Feb. 14	75	84	53	52	9.7	S	48	NW	Nov. 5	65	5.1	133	111	121	70	1	33	13	116	4	27	0

See reference notes at end of table.

Table 10–Continued

ANNUAL CLIMATOLOGICAL DATA

YEAR 1951

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
TEXAS (Cont'd.)																																				
Big Spring	78.3	51.4	64.9	110	June 20	0	Feb. 1	2615	10.11	1.66	June 2	3.0	2.5	Feb. 13	52	65	39	34	15.1	S	60	WSW	June 21	--	4.4	171	101	93	41	1	45	6	123	5	61	1
Brownsville	82.5	65.6	74.1	96	July 19	22	Feb. 1	588	24.21	4.39	Aug. 22	.0	.0	-----	86	89	58	70	12.9	SE	40	NW	Jan. 14	60	5.5	113	128	124	66	0	27	14	109	2	6	0
Corpus Christi	81.7	63.6	72.7	99	July °29	18	Feb. 1	928	26.91	6.00	Sept. 13-14	T	T	Jan. °29	85	89	60	72	13.4	SSE	54	SE	May 11	69	5.3	130	112	123	74	0	32	27	110	3	10	0
Dallas	77.8	55.4	66.6	107	Aug. °16	7	Feb. 1	2307	28.01	4.09	June 2-3	4.2	2.1	Feb. 13-14	67	77	50	49	11.4	S	50	S	Mar. 2	67	4.5	162	105	98	69	3	40	7	111	5	43	0
Del Rio	83.5	59.4	71.5	107	July °19	11	Feb. 2	1402	8.84	1.74	Oct. 28-29	T	T	Jan. °30	58	74	49	39	9.8	---	54	SE	June 7	74	4.6	163	92	110	42	0	35	5	149	3	20	0
El Paso	77.7	51.0	64.4	107	July 8	10	Feb. 1	2598	6.47	1.47	July 23-24	12.7	7.1	Dec. 7-8	39	49	31	26	10.2	WSW	66	W	Dec. 4	81	3.6	195	106	64	43	3	28	1	113	1	59	0
Fort Worth	78.4	54.7	66.6	107	Aug. °16	6	Feb. 1	2338	23.37	1.87	July 2	6.6	3.5	Feb. 13-14	63	74	45	45	14.6	S	49	WNW	Jan. °13	--	4.4	173	92	100	76	2	48	1	119	6	46	0
Galveston CO	74.9	65.0	70.0	96	July °19	17	Feb. 1	1115	33.51	2.84	Sept. 13-14	T	T	Jan. °31	AP 84	AP 86	AP 73	AP 79	12.8	AP SSE	50	NE	Aug. 17	60	5.4	AP 122	AP 124	AP 119	86	0	AP 64	AP 32	25	3	6	0
Houston CO	79.2	61.8	70.5	102	Aug. 4	14	Feb. 2	1241	27.23	2.37	July 25-26	T	T	Jan. °3	AP 85	AP 88	AP 59	AP 68	10.7	---	43	SE	Apr. °30	65	5.8	92	140	133	92	0	44	3	103	4	15	0
Laredo	86.3	63.3	74.8	106	Apr. °30	18	Feb. 2	835	15.48	4.12	Sept. 12-13	T	T	Jan. °30	71	83	50	45	13.9	SE	42	NW	Apr. 11	--	5.0	142	106	117	41	0	25	7	173	1	13	0
Lubbock	74.0	45.1	59.6	104	June 29	-7	Feb. 1	3742	15.53	1.93	May 16-17	7.2	3.5	Jan. 2	59	71	42	38	14.0	S	60	NNE	Mar. 28	--	4.5	163	97	105	52	5	47	8	93	8	106	2
Palestine CO	77.2	57.0	67.1	105	Aug. 17	9	Feb. 2	1977	27.63	2.52	Sept. 12-13	2.4	1.6	Jan. 31	--	84	--	55	8.4	---	45	W	Mar. 28	70	5.2	127	128	110	86	1	42	3	97	6	34	0
Port Arthur CO	77.2	62.5	69.9	99	Aug. 13	14	Feb. 2	1275	46.08	4.30	Mar. 26-27	.7	.7	Jan31-Feb.1	--	--	--	--	12.8	---	57	NE	Aug. 17	62	5.4	123	118	124	108	0	72	21	68	4	13	0
San Angelo	79.5	53.3	66.4	105	July 19	1	Feb. 2	2247	12.00	2.05	Aug. 12	3.2	2.8	Feb. 13-14	56	68	41	35	11.4	SSW	60	WNW	Apr. 30	--	4.5	162	114	89	41	2	34	2	127	5	53	0
San Antonio	81.1	57.8	69.5	105	July 19	6	Feb. 2	1561	24.44	6.18	June 3	1.3	.5	Jan. 31	74	82	52	49	9.6	SE	48	NW	Mar. 18	63	5.2	124	123	118	66	0	46	16	119	4	28	0
Victoria	81.5	61.4	71.5	105	Aug. 17	15	Feb. 2	1156	29.76	5.36	May 7	T	T	Jan. °29	84	88	57	65	9.4	SSE	61	N	Nov. 5	--	5.8	103	133	129	89	0	47	24	115	3	17	0
Waco	79.6	56.2	67.9	106	July 19	6	Feb. 2	2027	20.12	1.92	Sept. 12-13	1.8	1.0	Feb. 14	70	80	52	48	12.2	S	60	N	June 10	--	4.8	156	96	113	69	1	50	7	116	5	42	0
Wichita Falls	76.5	50.9	63.7	109	Aug. 6	-1	Feb. 1	3044	22.71	3.28	May 17-18	7.0	4.4	Feb. 13-14	62	72	46	43	12.6	SE	47	N	Apr. 10	--	4.3	186	81	98	59	3	46	2	107	8	74	1
UTAH																																				
Milford	64.1	33.0	48.6	100	July 18	-24	Jan. 31	6579	10.68	1.20	Oct. 26	43.4	6.0	Jan. 29	59	69	42	40	8.7	S	*46	* SSW	Jan. 18	--	4.7	149	108	108	53	18	38	10	55	25	178	16
Salt Lake City CO	61.9	42.0	52.0	100	July 15	3	Feb. 1	5567	18.79	1.75	Oct. 2-3	64.8	7.5	Mar. 1-2	AP 65	AP 70	AP 47	AP 45	AP 7.1	AP SSE	AP 45	AP W	Aug. 19	AP 65	AP 5.3	AP 134	AP 89	AP 142	104	21	AP 36	AP 8	30	22	123	0
VERMONT																																				
Burlington	54.4	36.4	45.4	89	June °19	-21	Feb. 10	7377	35.87	2.25	Sept. 14-15	73.9	9.8	Dec. 18-19	81	79	62	72	10.0	SSW	56	S	Mar. 30	36	7.2	59	94	212	162	19	18	23	0	59	146	16
VIRGINIA																																				
Cape Henry CO	66.9	53.2	60.1	97	June 24	18	Feb. 8	3165	39.78	3.63	June 28-29	6.7	3.4	Feb. 3	--	80	68	74	12.6	†SW	59	NW	Feb. 7	68	5.2	130	119	116	121	4	41	17	17	5	35	0
Lynchburg	67.0	46.0	56.5	96	June °2	8	Dec. 16	4220	39.77	2.65	Oct31-Nov.1	6.8	1.7	Jan. 13	77	78	51	64	8.7	SSW	56	SW	June 27	57	5.8	100	131	134	131	4	43	36	36	11	94	0
Norfolk CO	69.4	53.0	61.2	96	June °25	18	Feb. 8	2956	41.65	2.74	Nov. 2-3	3.5	1.9	Feb. 3	AP 81	AP 79	AP 58	AP 72	AP 10.4	AP S	38	NE	Oct. °4	63	AP 5.8	AP 113	AP 105	AP 147	124	1	43	AP 26	32	4	35	0
Richmond CO	69.0	48.3	58.7	98	July 23	13	Feb. °4	3626	38.26	1.66	Dec. 20-21	1.2	.5	Feb. 7	AP 81	AP 81	AP 52	AP 68	AP 7.6	AP SSW	AP 45	AP SW	AP Feb1	AP 60	5.9	93	123	149	113	0	42	15	37	6	71	0
Roanoke	67.3	45.1	56.2	98	July 23	5	Dec. 17	4273	32.55	1.65	Oct31-Nov.1	11.2	4.3	Mar. 13	77	78	49	61	8.0	W	--	---	----	--	6.0	98	131	136	115	4	37	24	40	11	96	0
Washington CO	66.7	48.5	57.6	96	June °2	10	Dec. 17	4009	42.47	2.52	June 9-10	7.2	3.0	Dec. 14	AP 74	AP 75	AP 52	AP 61	7.3	AP S	36	NW	Feb. 2	--	---	---	---	---	113	3	32	AP 18	37	11	77	0
Washington	66.5	48.6	57.6	96	June 2	11	Feb. 8	4007	41.34	2.90	July 28	9.6	3.4	Dec. 14	74	75	52	61	9.7	S	60	E	Mar. 13	57	6.1	97	103	165	113	4	29	18	28	10	76	0
WASHINGTON																																				
Ellensburg	58.8	34.2	46.5	97	July 23	-15	Jan. 30	7053	9.74	.81	May 10-11	62.5	8.7	Jan. 20-21	79	88	66	59	10.3	NW	59	WNW	Jan. °3	--	5.4	132	91	142	91	21	9	31	20	32	169	8
Kelso	61.0	40.4	50.7	95	June 29	11	Jan. 29	5210	46.49	1.89	Jan. 1-2	18.4	4.6	Mar. 5	--	--	72	--	----	---	--	---	----	--	6.9	79	85	201	149	6	--	--	4	2	75	0
North Head CO	54.4	45.1	49.8	91	July 11	21	Jan. °28	5491	57.43	2.17	Feb. 8-9	12.4	3.1	Mar. 6	86	87	83	79	14.9	---	78	W	Jan. 2	39	7.3	49	95	221	177	5	4	68	1	1	20	0
Olympia	60.5	38.7	49.6	95	June 29	9	Jan. 30	5596	53.98	4.93	Feb. 8-9	24.5	6.2	Mar. 9-10	86	94	74	61	4.8	SSW	*38	* SSE	Jan. 2	--	6.8	77	96	192	143	8	2	87	7	3	97	0
Port Angeles	53.6	43.1	48.4	79	June °29	20	Jan. 27	5981	22.88	1.32	Feb. 8-9	4.4	1.3	Mar. 5	83	86	77	74	11.1	W	*50	*E	Dec. 4	--	6.8	84	83	198	123	3	2	42	0	2	20	0

See reference notes at end of table.

Table 10—Continued

ANNUAL CLIMATOLOGICAL DATA

YEAR 1951

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail							Average hourly speed	Prevailing direction	Fastest mile					Sunrise to sunset			Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	Max temp		Min temp.	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs	Date							Speed	Direction	Date			Clear	Partly cloudy	Cloudy					90° and above	32° and below	32° and below	Zero and below
WASHINGTON (Cont'd)																																				
Seattle CO	60.3	45.4	52.9	96	July 12	20	Jan. 28	4509	34.58	2.46	Feb. 8-9	9.4	2.3	Mar. 5-6	AP 76	AP 85	AP 69	AP 58	9.2	N	63	SW	Jan. 15	53	6.5	101	72	192	142	3	5	15	4	2	24	0
Spokane	56.6	36.9	46.8	98	July 17	-9	Dec. 31	6998	19.30	1.60	Dec. 17-18	93.5	12.1	Dec. 17-18	66	75	58	52	8.0	SSW	50	SW	Jan. °15	47	6.1	110	82	173	123	27	7	38	19	42	148	5
Stampede Pass CO	45.7	32.4	39.1	83	Aug. 20	-3	Jan. 29	9383	91.07	3.86	Feb. 8-9	510.6	32.8	Dec. 21-22	--	88	77	73	12.3	---	78	SW	Mar. 15	--	6.2	112	62	191	171	75	5	216	0	112	194	5
Stevenson CO	59.2	43.7	51.5	96	Aug. 20	15	Jan. 29	5115	76.61	3.50	Oct. 22-23	60.5	14.0	Mar. 7-8	--	--	68	59	----	---	--	---	----	--	6.5	107	56	202	144	16	5	7	7	11	49	0
Tacoma CO	58.6	43.9	51.3	95	July 12	17	Jan. 30	5032	30.80	*3.12	Feb. 8-9	15.2	4.2	Mar. 7-8	--	--	72	--	7.3	SW	52	S	Jan. 15	52	6.0	94	119	152	137	5	1	38	2	3	32	0
Tatoosh CO	52.2	44.0	48.1	76	Sept 14	24	Jan. 28	6082	79.97	3.48	Feb. 9-10	31.8	10.8	Mar. 6-7	87	88	84	82	14.6	E	70	SW	Jan. 16	29	7.9	39	70	256	181	8	8	77	0	2	18	0
Walla Walla CO	63.2	43.9	53.6	102	July 23	4	Jan. 29	4986	14.72	1.18	June 4-5	22.5	4.2	Dec. 19-20	--	--	53	--	5.6	---	42	SW	Jan. 15	63	5.5	137	78	150	99	11	7	11	38	21	77	0
Yakima	63.3	34.8	49.1	100	July 17	-7	Jan. 30	6203	10.24	1.08	June 5-6	32.0	7.4	Mar. 7-8	69	77	51	44	6.8	W	--	---	----	--	5.2	153	72	140	74	11	9	20	41	24	173	3
WEST VIRGINIA																																				
Charleston	67.5	44.4	56.0	97	July 23	-2	Feb. 3	4313	51.09	2.45	Jan31-Feb.1	17.9	4.1	Mar. 13-14	82	83	54	63	8.0	SW	*50	NW	June 27	--	6.8	73	103	189	157	7	40	135	33	11	101	1
Elkins	62.5	37.7	50.1	91	Aug. 31	-5	Feb. °3	5751	42.93	1.86	June 9-10	34.0	3.4	Dec. 18	87	89	59	73	5.3	WNW	72	NW	July 5	48	7.3	48	115	202	167	14	49	99	3	24	134	5
Huntington CO	69.3	45.4	57.4	98	July 23	-1	Feb. 2	4018	46.04	2.35	Aug. 27-28	19.5	4.5	Dec. 18	--	--	--	--	----	---	--	---	----	--	---	---	---	---	151	---	---	---	53	12	86	1
Parkersburg CO	65.4	44.0	54.7	95	June °2	-4	Feb. 3	4716	40.94	1.89	Sept. 13-14	19.6	3.5	°Mar. 13-14	--	--	--	--	5.9	---	40	SW	June 22	53	6.6	91	87	187	145	6	47	---	22	18	104	3
Petersburg	66.5	41.2	53.9	99	Aug. 15	-7	Dec. 17	4892	31.09	1.80	June 12-13	16.8	5.0	Dec. 18	--	--	52	66	----	---	--	---	----	--	6.4	91	99	175	107	7	30	18	41	15	117	1
WISCONSIN																																				
Green Bay	50.8	31.9	41.4	88	July 26	-31	Jan. 30	8736	33.35	2.62	Aug. 17-18	53.4	7.3	Mar. 2-3	81	81	64	71	11.4	SW	68	W	Mar. 1	51	6.7	79	104	182	143	20	31	28	0	87	167	38
La Crosse	52.6	34.1	43.4	91	July 26	-37	Jan. 30	8273	38.85	2.76	July 20-21	65.0	9.1	Mar. 10	81	83	63	67	9.8	S	38	SW	Oct. °30	--	7.1	75	86	204	131	19	47	32	3	87	155	40
Madison CO	52.5	36.6	44.6	89	July 26	-26	Jan. 30	7812	35.98	1.54	Sept. 12	67.7	5.5	Feb. 12-13	AP 81	AP 82	AP 62	AP 71	AP 11.5	AP W	AP 73	AP SW	AP Oct. 30	AP 51	AP 6.8	AP 75	AP 103	AP 187	136	25	AP 43	AP 32	0	79	142	25
Milwaukee	53.0	36.5	44.8	90	July 26	-24	Jan. 30	7640	36.43	1.56	July 8	88.1	8.1	Jan. 28	80	82	66	72	11.7	SW	50	S	Dec. 6	49	6.8	76	98	191	141	28	31	42	1	61	145	19
WYOMING																																				
Casper	55.6	30.6	43.1	97	July 19	-23	Jan. 28	8217	10.93	1.33	July 21	57.8	8.0	Mar. 2-3	64	69	45	44	11.6	SW	--	---	----	--	5.9	101	114	150	100	17	45	5	17	49	189	17
Cheyenne	55.2	30.5	42.9	92	July 7	-27	Jan. 31	8182	17.16	1.34	Oct. 4-5	55.0	5.9	Jan. 28	68	70	46	51	13.3	W	69	NW	May 25	61	5.9	99	122	144	115	19	69	35	4	40	200	18
Lander	56.0	29.2	42.6	97	July 19	-25	Feb. 1	8337	14.03	1.95	May 20-21	74.1	16.1	May31-June1	60	67	46	44	7.2	---	59	SW	Jan. 15	65	5.3	119	119	127	79	20	24	1	16	40	205	20
Rock Springs	52.9	29.4	41.2	93	July 19	-18	Jan. 31	8781	5.39	.47	June 10	36.2	5.0	Jan. 18-19	62	70	48	46	14.1	W	62	WSW	Mar. 16	--	6.0	94	118	153	78	12	36	5	3	68	205	13
Sheridan	56.0	29.3	42.7	99	July 14	-30	Jan. 29	8394	14.79	1.39	July 9-10	71.9	10.8	Mar. 20-21	72	76	51	54	8.6	NW	59	W	Dec. 28	63	6.0	83	140	142	124	24	49	8	18	52	200	30
PACIFIC AREA																																				
Canton Island	90.4	78.5	84.5	97	Apr. °22	73	June °24	0	30.36	2.67	Apr. 23-24	.0	.0	-----	78	82	82	68	----	---	*36	* ESE	Oct. 7	--	5.7	55	236	74	119	0	7	0	211	0	0	0
Hilo	80.6	65.7	73.2	92	Sept 21	56	Feb. 9	0	150.01	8.88	Oct. 27-28	.0	.0	-----	84	87	82	69	5.5	SW	35	SE	Feb. 21	38	7.2	34	137	194	293	0	4	0	1	0	0	0
Honolulu CO	79.9	70.8	75.4	87	Aug. 15	61	Feb. 9	0	37.60	4.08	Mar. 13	.0	.0	-----	AP 72	AP 77	AP 74	AP 59	AP 11.2	AP ENE	AP 59	AP SE	AP Mar. 26	AP 63	AP 4.9	AP 130	AP 161	AP 74	158	0	6	0	0	0	0	0
Lihue	80.7	68.9	74.8	87	Aug. 12	53	Feb. 22	2	56.18	4.99	Oct. 28-29	.0	.0	-----	78	82	80	68	10.2	NE	36	NE	Jan. 14	55	6.2	52	200	113	210	0	9	0	0	0	0	0
Wake Island	84.7	78.0	80.4	91	Aug. 23	68	Mar. 18	0	24.71	1.38	Oct. 1-2	.0	.0	-----	74	80	81	71	12.9	E	--	---	----	--	4.6	148	162	55	184	0	2	0	5	0	0	0
WEST INDIES																																				
San Juan, P.R.	83.6	73.2	78.4	93	Aug. °20	64	Feb. °5	0	66.42	3.84	Dec. 3-4	.0	.0	-----	AP 85	AP 79	AP 70	AP 79	AP 9.3	AP ESE	AP 40	AP E	AP July 29	AP 60	AP 5.7	AP 87	AP 176	AP 102	205	0	68	0	19	0	0	0
Santa Isbel, P.R.	86.2	68.9	77.6	94	Aug. 15	57	Feb. 28	0	30.04	2.34	Oct. 8-9	.0	.0	-----	90	77	66	82	5.8	NE	26	ESE	Apr. 18	--	5.6	109	150	106	100	0	86	0	16	0	0	0
VIRGIN ISLANDS																																				
St. Croix	86.1	72.8	79.5	90	June °19	62	Feb. °22	0	38.95	2.89	Nov. 3	.0	.0	-----	85	77	68	83	11.6	ESE	35	ESE	Sept. 2	--	6.1	51	205	109	192	0	64	0	29	0	0	0

See reference notes at end of table.

ANNUAL CLIMATOLOGICAL DATA

State and Station	Temperature							Degree days	Precipitation						Relative humidity				Wind					Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days										
	Averages			Extremes								Snow, Sleet, Hail									Fastest mile					Sunrise to sunset							Max. temp.		Min. temp.	
	Daily maximum	Daily minimum	Annual	Highest	Date	Lowest	Date		Total	Greatest in 24 hrs.	Date	Total	Greatest in 24 hrs.	Date					Average hourly speed	Prevailing direction	Speed	Direction	Date			Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Sleet, Hail 1.0 or more	Thunderstorms	Heavy fog	90° and above	32° and below	32° and below	Zero and below
ALASKA																																				
Anchorage	41.6	24.3	33.0	82	July 10	-32	Jan. 18	11604	16.63	1.79	Sept. 3-4	60.7	7.1	Mar. 19-20	76	81	76	66	5.2	N	62	S	Feb. 22	36	7.5	64	66	235	117	21	0	37	#17	122	211	61
Annette	49.6	38.8	44.2	79	Aug. 29	9	Mar. 5	7490	80.84	2.54	Aug. 13-14	51.1	8.8	Dec. 25	81	83	77	72	11.6	SE	*50	*SE	Sept. 8	--	8.1	42	54	269	196	15	0	36	#17	24	100	0
Barrow	17.1	5.8	11.5	72	July 15	-53	Jan. 15	19465	5.36	.60	July 24-25	23.5	2.8	Oct. 10-11	76	76	76	76	12.9	ESE	70	WNW	Dec. 27	--	7.1	76	62	227	100	8	0	72	#1	252	294	151
Bethel	36.6	22.0	29.3	86	July 12	-45	Jan. 14	12967	40.76	2.40	Aug. 11-12	149.5	9.9	Mar. 15	83	88	85	75	9.9	S	*62	* SSE	Feb. 21	--	8.0	49	49	267	197	47	0	21	#6	128	217	74
Cordova	44.4	27.1	35.8	81	July 3	-18	Jan. 15	10566	98.87	7.92	Sept. 3-4	123.9	13.1	Feb. 26-27	88	90	85	79	3.2	E	58	E	Nov. 1	--	8.0	52	44	269	205	26	0	13	#5	58	199	36
Fairbanks	36.0	14.1	25.1	90	July 16	-54	Jan. 19	14505	10.24	.93	Aug. 26-27	58.0	4.9	Jan. 6-7	68	78	71	58	4.5	N	50	SW	July 16	--	7.0	71	80	214	105	19	4	30	#48	161	225	120
Galena	31.8	13.3	22.6	84	July 14	-64	Jan. 15	15429	17.17	1.25	Sept. 4-5	61.7	9.0	Feb. 22	68	76	73	64	8.1	NNE	*86	* SSW	Feb. 22	--	6.7	87	69	209	133	22	1	14	#22	174	221	115
Gambell	28.5	20.4	24.5	57	June °28	-26	Mar. 2	1468[illegible]	21.95	1.29	Feb. 20-21	139.8	12.9	Feb. 20-21	85	85	84	82	[illegible]	NNE	78	SE	Oct. 16	--	8.1	39	64	262	154	38	0	43	#0	176	248	66
Juneau	45.5	31.4	38.5	83	July 4	-8	Jan. 28	9577	37.80	1.54	Oct. 10-11	88.2	9.1	Nov. 17-18	80	85	78	71	6.6	E	52	SE	Jan. 12	31	8.0	46	52	267	188	26	0	14	#29	85	158	23
Kotzebue	26.8	14.7	20.8	77	June 27	-42	Dec. 5	16055	13.21	.94	Aug. 19-20	56.2	6.8	Feb. 25	78	81	80	76	15.2	E	*93	* ESE	Feb. 25	--	6.3	105	70	190	129	22	0	16	#4	193	245	114
McGrath	35.0	16.1	25.6	85	July 13	-58	Jan. 18	14342	20.57	1.26	June 3-4	124.0	8.1	Jan. 25-26	73	83	77	66	4.3	N	*75	*S	Feb. 22	--	7.5	68	62	235	148	43	5	11	#24	161	222	97
Nome	32.9	19.4	26.2	77	June 26	-37	Mar. 2	14102	20.73	1.39	Aug. 9	72.7	8.4	Dec. 28-29	81	83	81	77	11.1	ENE	72	SW	Feb. 25	--	6.5	101	60	204	128	22	1	11	#2	160	232	87
Northway	32.1	10.0	21.1	87	July 8	-56	Feb. 7	15986	7.09	1.21	July 18	29.5	6.2	Apr30-May 1	68	77	66	55	3.1	NW	*36	* NNW	Dec. 28	--	7.6	48	69	248	77	10	8	3	#45	176	233	147
St. Paul Island	39.9	31.8	35.9	57	June °24	-2	Mar. 27	10542	26.57	1.47	Nov. 18-19	45.0	2.7	Dec. 30-31	87	88	87	84	----	---	--	---	----	--	9.0	9	56	300	232	18	1	31	#0	74	164	1
Umiat	18.5	2.1	10.3	85	July 15	-63	Feb. 20	20045	7.79	.80	Aug. 29-30	24.9	3.2	Dec. 25-26	78	83	77	72	7.8	W	*75	* WSW	Dec. 27	--	6.9	Φ62	Φ68	Φ189	108	6	1	18	#15	228	278	171
Wales	26.4	16.1	21.3	58	July 14	-40	Mar. 2	158[illegible]2	7.76	1.57	Aug. 21	25.3	2.2	Feb. 25	--	--	--	--	----	---	--	---	----	--	7.5	58	75	231	89	7	---	---	#0	193	254	108
Yakutat	44.4	31.3	37.9	79	July 4	-14	Feb. 7	9785	[illegible]9.38	4.24	Oct31-Nov.1	194.8	14.3	Jan. 31	88	87	84	79	7.3	E	*45	* ESE	Jan. 12	--	8.2	41	58	266	197	48	0	36	#4	68	178	18

Data from airport unless otherwise indicated.

CO after station name indicates city office data, except where certain elements are from the airport, which are indicated by AP above each value.

° Also on later dates.

* Data entered in column headed "Fastest Mile" is the fastest mile observed. This station is not equipped with automatic recording wind instrument.

† Wind direction to 8 compass points only.

†† Data are from city office records up to and including May 1951, and airport data thereafter.

‡ Data are from city office records up to and including June 1, 1951, and airport data thereafter.

# Number of days Maximum 70°F. or above for Alaskan Stations.

Φ Sun below horizon November 2[illegible], 1950 to January 15, 1951.

GENERAL SUMMARY OF TORNADOES IN THE UNITED STATES

YEAR 1951

The 300 tornadoes that were reported during 1951 in the United States was nearly twice the annual average for the period 1916 through 1951. This is the greatest number of storms of this character to have occurred during a single year in this country for the past 36 years of record; the next highest total of 262 was reported in 1949. Tornadoes occurred during each month, on 119 days of the year, and in 37 States. The 11 States not visited by these twisters were Montana, Idaho, Nevada, and Utah in the West, and Maine, Vermont, Rhode Island, New York, Maryland, Delaware, and South Carolina in the East. The District of Columbia also escaped visitation of storms of this character. Four of the 1951 tornadoes crossed State boundaries; 1 in March from Oklahoma to Kansas, 2 in May from Oklahoma to Kansas, and 1 in June from Iowa to Minnesota. The 109 tornadoes recorded in Kansas during the year, was the greatest number ever reported in any State for any year. Oklahoma ranked second for 1951 with 45 tornadoes, and Texas was third with 15.

Nineteen of the 109 tornadoes reported in Kansas, 4 of the 45 in Oklahoma, and 1 of the 15 in Texas were distinct funnel clouds which failed to reach the ground. Colorado, Wyoming, North Dakota, Ohio, and Kentucky each reported a funnel cloud aloft, making a total for the country of 29 clouds observed with definite funnels which did not reach the ground. Three of the Florida tornadoes originated as waterspouts over the Gulf of Mexico:—One entered Pinellas County, near Clearwater on March 12, with no damage occurring; the second moved inland on March 12, near Nokomis, Sarasota County, where 15 buildings were damaged to the amount of $45,000; the third near Captiva Island on July 11 caused no property damage. The only West Virginia tornado of the year was first observed as a waterspout over the Ohio River on June 26. It entered Wood County where damage of over $4,000 was reported. The other waterspout of the year originated over the Atlantic Ocean and moved to Brunswick County, N. C., on July 6, demolishing a house at Long Beach valued at $7,000.

May, usually the month of greatest occurrence, was exceeded by June in 1951, when 89 tornadoes were reported. May recorded 74, with August in third place with 29, closely followed by April with a total of 27 and July with 25.

Although the number of tornadoes occurring during 1951 was the greatest ever known for any year in the country, the death total of 34 was exceedingly small compared to the 36-year average of 222. The only other year that had less fatalities resulting from tornadoes was 1937 with 29 deaths. Contributing factors in the low death toll of 1951 apparently were the greater interest in tornadoes and the progress made in forecasting and alerting the public. In the 37 States in which tornadoes occurred only 10 reported resulting fatalities. The States with the greatest loss of life during the year were Wisconsin and Kansas with 7 fatalities each, followed by Minnesota with 6 deaths.

The total amount of estimated damage of over $29,000,000 for the United States was greater than the average for the past 36 years, but as losses of previous years were based on values estimated at the time of occurrences, comparisons cannot accurately be made without adjustment due to the change in the price index. Minnesota suffered the greatest destruction of property during 1951, with losses of $7,250,000. This great amount was the result of only 5 tornadoes, one of which caused estimated damage of $6,000,000 and death to 5 persons. Iowa was second in the amount of property destroyed, with damage of $6,730,000. Kansas and Illinois ranked third and fourth, with losses of $2,675,825 and $2,635,500 respectively. Of the States in which tornadic occurrences were recorded, several reported no damage or negligible damage. In Arizona two twisters occurred, but both passed over open range land with no destruction of property. Oklahoma reported two such storms and Kansas one, which struck harmlessly in open fields. The two New Mexico tornadoes also struck over open range land. The only occurrence in Oregon during the year caused negligible damage. Losses did not exceed $1,000 each for 53 of the tornadoes that reached the ground. The 29 other tornadoes which remained aloft obviously caused no damage.

June with over $16,500,000 damage ranked first in property destruction in 1951, and greatly exceeded the 36-year average of $2,500,000. July was next with damage of over $6,000,000 compared with the 36-year average of $706,000. January and December were in third and fourth places, which is quite unusual as they generally rate 9th and 11th respectively. The month of March, which has had the greatest average amount of damage for the period 1916 through 1951, had only $150,300, which placed it in 11th place for the year.

Seven tornadoes with resulting damage of $1,000,000 or more from a single twister were reported during the year in California, Illinois, Iowa, Kansas, Minnesota, and Texas. Damage of $1,150,000 occurred in Minnesota on June 19, but it is believed that this damage was the result of three tornadoes, so it is not counted with the single tornadoes causing $1,000,000 or more damage. The two most destructive tornadoes of the year, regarding loss of life and property, struck in Minnesota and Kansas. The most damaging tornado of record in Minnesota occurred in Hennepin County on July 20, when $6,000,000 worth of property was destroyed and five persons lost their lives. The other disastrous tornado of the year traveled over Gove and Trego Counties, Kans., on the night of June 26 and 27, with resulting property damage of $2,080,000 and five fatalities. A tornado in Wisconsin on September 26, caused a death toll of six, but with only $250,000 property damage.

Two hundred and fifty-four or 88 percent of the 1951 tornadoes on which the time was reported occurred between noon and midnight, compared with 82 percent for the past 36 years. One hundred and forty-nine or 52 percent of the tornadoes in 1951 occurred between 3 and 8 p.m. which is practically the same as the 36-year average. No tornadoes were reported in 1951 between 4 and 5 a.m. Records for the past 36 years show that the time of least occurrence is usually between 5 and 8 a.m., when only about 3 percent of these storms have occurred.

The prevailing direction of movement of tornadoes during the past year was as usual from the southwest to the northeast; however, only 44 percent traveled in that direction compared to the 36-year average of 60 percent. Thirty-three percent moved from the west toward the east, which is nearly double the 17-percent average of that direction of movement; also, about twice the average number moved northward.

The longest tornado path of the year crossed

Lonoke, Prairie, Woodruff, Cross, and Poinsett Counties, Ark., for 115 miles on February 20. The average length of paths during 1951 was about 10 miles and the average width 338 yards. Regarding width of paths, Arkansas, Kansas, and Michigan, each reported tornadic storms with paths 2 miles wide. The narrowest during the year was 8 yards, in Michigan on June 1.

TORNADO DATA

Table 11

YEAR 1951

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
ALABAMA										
1. Feb. 20	4 p.m.	Fayette	(1)	1	125	0	2	$50,000	$0	Occurred at Bankston. Telephone and power lines damaged considerably. Fifteen buildings damaged; 1 blown away.
2. June 8	A.m.	Madison	(1)	(1)	(1)	0	2	5,000	0	Home about 4 miles north of New Market leveled. Granary destroyed, other buildings damaged.
3. Nov. 15	P.m.	Cullman	NE	(1)	(1)	0	2	7,000	0	Two homes destroyed, 1 damaged, 1 other building destroyed.
4. Nov. 15	P.m.	Blount	NE	(1)	(1)	0	1	1,000	0	Three homes damaged.
5. Nov. 15	8-10 p.m.	Lauderdale	NE	1 1/2	100-250	0	6	24,500	0	Occurred near Oakland.
ARIZONA										
1. Aug. 3	4:20 p.m.	Yavapai	W	(1)	(1)	0	0	0	0	Over range land. Cloud observed 15 miles ENE of Prescott Airport. Cone seemed to touch ground several times.
2. Aug. 22	10 a.m.	Yavapai	E	(1)	(1)	0	0	0	0	Over range land. Cloud formed 4 miles WSW of Chino Valley Station. Touched ground momentarily.
ARKANSAS										
1. Feb. 20	9:15 a.m.	Lonoke, Prairie, Woodruff, Cross, and Poinsett	NE	115	2/ 2	0	3	32,500	(3)	Storm progressed from Keo in Lonoke County to beyond Marked Tree in Poinsett County.
2. Oct. 23	3 a.m.	Yell	(1)	(4)	(5)	0	4	(6)	0	Storm completely destroyed a home and all contents. No evidence of storm having struck anywhere else, even in vicinity. Homes and outbuildings within 100 yards and less of home not damaged.
CALIFORNIA										
1. Jan. 11	8:25-8:30 a.m.	Santa Clara	ESE	3-4	1,000	0	0	1,500,000	0	Struck Los Altos-Sunnyvale.
2. Jan. 11	8:45 a.m.	Santa Clara	ESE	2-3	100	0	0	50,000	0	Struck San Jose district. Roofs ripped off homes; trees forced down; other property damaged.
COLORADO										
1. May 17	5:35 p.m.	Douglas and Elbert	NW	(1)	(1)	0	0	0	0	Sighted by Airlines pilot and on radar screen at Lowery Air Base. Accompanied by severe thunderstorm.
2. May 20	2 p.m.	Sedgwick	E	15	(1)	0	0	50,000	25,000	Covered eastern half of county, advancing toward Big Springs, Nebr. Several small tornadoes.
3. June 6	12:30 p.m.	Lincoln	SSE	3-4	225	0	2	1,500	0	Garage and granary demolished, chicken house overturned, water tank and windmill damaged.
4. June 14	Evening	El Paso	(1)	(1)	(1)	0	0	3,000	0	Two barns, chicken house, garage, granary and automobile demolished.
5. June 18	5-6:30 p.m.	Crowley and Otero	(1)	30	(1)	0	0	5,000	25,000	Damage to outbuildings on ranch.
6. June 25	4:30-5 p.m.	Phillips	(1)	(1)	(1)	0	0	20,000	15,000	Damage mostly to crops, windows and small buildings.
CONNECTICUT										
1. Aug. 20	3-6 p.m.	Tolland	NE	(1)	(1)	0	0	(6)	(6)	Described as "local tornado". At Willington; barn lifted from foundation and hurled onto 2 parked cars.
2. Aug. 21	5:15-5:30 p.m.	Litchfield and Middlesex	NE	1/2	100	0	9	125,000	10,000	Havoc wrought by tornadic winds in many towns in western Conn., collapsing barn and unroofing a factory, injuring occupants.
DELAWARE										
(None reported)										
DIST. OF COLUMBIA										
(None reported)										
FLORIDA										
1. Mar. 12	(1)	Pinellas	(1)	(1)	(1)	0	0	0	0	Waterspout over Gulf of Mexico; near Clearwater.
2. Mar. 12	Early evening	Sarasota	E	2	75	0	0	45,000	0	Moved inland from Gulf of Mexico; 7 homes, 8 other buildings damaged near Nokomis.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
FLORIDA (Cont'd.)										
3. May 26	10:30 a.m.	Franklin	NE	(1)	(1)	3	0	$75,000	(3)	Deaths due to drownings of fishermen when small boat upset; occurred at Carrabelle.
4. May 26	1:30 p.m.	Columbia	(1)	(1)	(1)	0	0	(6)	$0	Damaged 3 houses at Lake City.
5. July 11	4 p.m.	Lee	(1)	(1)	(1)	0	0	0	0	Waterspout over Gulf of Mexico, near Captiva Island.
6. July 22	4:20 p.m.	Hillsborough	NW	(1)	(1)	0	0	2,000	0	One house destroyed and other minor damage at Ruskin.
7. Dec. 4	12:25 p.m.	Polk	NE	5	25	0	0	800	0	Interrupted path. Occurred near Kathleen.
8. Dec. 18	(1)	Polk	(1)	(1)	(1)	0	0	0	(3)	At Lake Moody, 3 miles north of Frostproof.
9. Dec. 18	6:45 p.m.	Polk	E	5	150	0	0	50,000	200	Occurred at Fort Meade.
10. Dec. 18	Early evening	Pinellas	E	1	100	0	0	2,500	0	Occurred at St. Petersburg.
11. Dec. 18	2:30 p.m.	Duval	NNE	1/2	35	0	0	2,000	0	Damage to roofs at Jacksonville.
GEORGIA										
1. May 23	Late evening	Colquitt	E	10	(5)	0	0	600	15,000	Storm dipped and rose several times along 10-mile length, New Elm to Norman Park. Tobacco barn and several small houses demolished, with heavy damage to an automobile, wire fences, utility lines, and crops.
2. May 23	Late evening	Liberty	(1)	(1)	200-400	0	0	10,000	0	Storm moved across rural section, damaging 20 homes and other buildings, utility lines, and causing other miscellaneous damages.
3. Nov. 16	7:55 a.m.	Dougherty	NE	(4)	100	0	0	1,000	0	Storm struck locally 2 1/2 miles south of Albany. Industrial plant unroofed, exposing contents to rain.
IDAHO										
(None reported)										
ILLINOIS										
1. June 27	7:30-7:40 p.m.	Logan	E	8	300	1	35	355,000	650,000	Occurred near Homer and Latham. Accompanied by severe thunderstorm and heavy rain.
2. June 27	8:45-9:30 p.m.	Logan	E	15	200	0	15	550,000	700,000	Most of damage in Emden-Hartsburg area.
3. Nov. 13	2:50 p.m.	Jackson	NE	6	250	0	9	95,500	500	Completely demolished 10 homes at Campbell Hill.
4. Nov. 13	1:15 p.m.	Mason, Tazewell, and McLean	E	50	50	0	0	42,500	25,000	Path not continuously on surface. Moved from Mason City to Hudson. Much of tornado's force spent on open farm land.
5. Dec. 6	6 p.m.	Putnam	NE	25	150	1	1	200,000	17,000	A majority of damage occurred in Spring Valley.
INDIANA										
1. Mar. 29	6:30 p.m.	Hancock	NE	4	400	0	2	100,000	0	Struck Greenfield and vicinity.
2. June 21	7:50 p.m.	Pulaski and Fulton	E	8	(1)	0	4	750,000	50,000	Struck in farming section. Destroyed 14 barns; damaged houses, automobiles and trees; killed livestock and poultry.
3. July 9	1 a.m.	Howard	SE	(1)	1,760	0	0	100,000	2,000	Struck Kokomo.
4. Nov. 13	4 p.m.	Lake	NE	1/4	400	0	0	300,000	0	Struck Gary.
IOWA										
1. June 1	9:15 p.m.	Marshall	NE	1 1/2	880	0	7	600,000	(3)	Demolished 4 houses; damaged 145 buildings in southern Marshalltown.
*2. June 19	4 p.m.	Lyon	NE	1/2	17	0	0	10,000	(3)	Northern part of Allison Township; damage to farm buildings.
3. June 25	5:07 p.m.	Hancock	NE	3/4	500	1	8	4,500,000	1,500,000	Severe damage to town of Duncan, with extensive damage in county to bridges and other property resulting from torrential rains.
4. July 17	5:45 p.m.	O'Brien	S	(4)	(5)	0	2	19,000	90,000	Damage to buildings in town of Sheldon.
5. Aug. 26	Midnight	Plymouth	NE	6	140	0	0	11,000	(6)	Buildings on 5 farms north of Remsen damaged; some livestock killed.
KANSAS										
1. Mar. 2	4-5 p.m.	Osborne, Mitchell, and Cloud	N and E	(1)	(1)	0	0	(6)	(6)	Tornado moved from near Corinth to Downs to Beloit and Jamestown. Few buildings damaged, trees uprooted; wide path through wheat field.
2. Mar. 8	8:30 p.m.	Brown	(1)	(1)	(1)	0	0	500	0	Barn destroyed.

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KANSAS (Cont'd.)										
*3. Mar. 27	6:30 p.m.	Barber	NNE	18	(1)	0	0	$0	$0	Tornado sighted aloft; never touched ground. Moved from Capron, Okla.
4. Apr. 20	3:30 p.m.	Morton	(1)	(1)	(1)	0	0	0	0	Struck in open field 8 miles west of Rolla.
5. Apr. 26	6:10 p.m.	Grant	NE	32	(1)	0	0	4,000	0	Few farm buildings damaged near Ulysses.
6. Apr. 26	6:15 p.m.	Morton	(1)	(1)	(1)	0	0	2,000	0	Derailed 2 cars of freight train 3 miles north of Rolla.
7. Apr. 26	7:15 p.m.	Seward	(1)	(1)	(1)	0	0	(3)	0	Only slight damage north of Liberal.
8. Apr. 26	Evening	Morton	(1)	(1)	(1)	0	0	(3)	0	Damaged several residences, grain bins, and garages in and near Wilburton.
9. Apr. 28	8:30 p.m.	Wabaunsee	(1)	(1)	(1)	0	0	0	0	Observed aloft south of Willard.
10.Apr. 30	6:25 p.m.	Pratt	NE	10	880	0	0	50,000	0	Roofs, plate glass, poles damaged in 3-block path through Pratt.
11.Apr. 30	11:45 p.m.	Chautauqua	NE	(1)	(1)	0	0	2,000	0	Damage on several farms to porches, barns, sheds and trees west of Cedar Vale.
12.May 2	7:30 p.m.	Shawnee	NE	(4)	10	0	0	100	0	Small damage to porch and shed 6 miles west and 1 mile south of Topeka Post Office.
13.May 2	8:30 p.m.	Atchison	(1)	(1)	(1)	0	0	200	0	Several farm buildings blown over 8 miles south of Effingham.
14.May 2	9:30 p.m.	Shawnee	(1)	(1)	(1)	0	0	0	0	Heard aloft distinctly; did not reach ground.
15.May 8	6 p.m.	Wichita	(1)	(1)	(1)	0	0	300	0	Destroyed sheep sheds 6 miles south of Selkirk.
16.May 9	7 a.m.	Jefferson	(1)	3	(1)	0	0	250	0	Small buildings and farm machinery turned over 1 1/2 miles southwest of Valley Falls.
17.May 9	9 p.m.	Osage	(1)	(1)	(1)	0	0	See remarks	0	Roar heard. Trees damaged at Overbrook.
18.May 13	Night	Ellis	(1)	(1)	(1)	0	0	800	0	Lifted roof from house in northwestern part of county.
19.May 14	Afternoon and night	Extreme western counties	N and NE	(1)	(1)	0	4	85,150	0)	Fifteen funnels in 2 squall lines from south of Elkhart, Okla. to Nebraska line. Injuries occurred when automobile struck near McDonald.
*20.May 14	do	do	do						)	
*21.May 14	do	do	do						)	
22.May 14	do	do	do						)	
23.May 14	do	do	do						)	
24.May 14	do	do	do						)	
25.May 14	do	do	do						)	
26.May 14	do	do	do						)	
27.May 14	do	do	do						)	
28.May 14	do	do	do						)	
29.May 14	do	do	do						)	
30.May 14	do	do	do						)	
31.May 14	do	do	do						)	
32.May 14	do	do	do						)	
33.May 14	do	do	do						)	
34.May 20	Evening	Rawlins	(1)	(1)	(1)	0	0	(3)	0	Picked up gasoline truck near McDonald.
35.May 20	7-7:30 p.m.	Kearny	NE and E	(1)	(1)	0	0	120,000	0)	Two funnels near Lakin; houses, barns, grain bins damaged; also hail and wind damage.
36.May 20	do	do	do			0	0		)	
37.May 21	1 a.m.	Geary	(1)	(1)	(1)	0	0	200	0	Tore roofing from 2 buildings 7 miles west of Junction City.
38.May 21	7 p.m.	Stanton	E	(1)	(1)	0	0	(3)	0	Pulled stucco from house south of Johnson; also hail damage.
39.May 25	2:30 p.m.	Cloud	(1)	(1)	(1)	0	0	(3)	0	Shed and chicken house destroyed 12 miles southeast of Concordia.
40.May 25	3:15 p.m.	Washington	(1)	(1)	(1)	0	0	0	0	Small funnel aloft near Haddam.
41.May 25	4 p.m.	Clay	NE	3 to 3 1/2	440	1	0	60,000	6,000	Near Ladysmith, dipped several times; wrecked farm buildings, damaged cars, killed chickens.
42.May 25	Late afternoon	Republic	(1)	(1)	(1)	0	0	2,000	0	Destroyed farm buildings, overturned machinery 2 miles south of Norka.
43.May 30	Evening	Ellis	(1)	(1)	(1)	0	0	5,000	0	Buildings damaged, livestock killed 4 miles southeast of Hays.
44.May 30	10-11:45 p.m.	Clay, Riley, Geary, Pottawatomie, and Jackson	E	90	(1)	0	0	9,000	0)	Eight tornadoes caused scattered damage to residences, barns, and power lines from central Clay County to central Jackson County.
45.May 30	do	do	do	do					)	
46.May 30	do	do	do	do					)	
47.May 30	do	do	do	do					)	
48.May 30	do	do	do	do					)	
49.May 30	do	do	do	do					)	
50.May 30	do	do	do	do					)	
51.May 30	do	do	do	do					)	
52.May 31	11:45 p.m.	Jefferson	NE	3 1/2	440	0	0	4,000	0	Damage on 3 farms near Nortonville.

See reference notes at end of table.

Table 11—Continued

TORNADO DATA

YEAR 1951

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KANSAS (Cont'd.)										
53.June 1	Evening	Republic	NE	(1)	(1)	0	0	$1,000	$0)	One funnel damaged several farms south of Formosa to Scandia. Two other funnel clouds caused minor damage in area.
54.June 1	do	do	do						)	
55.June 1	do	do	do						)	
56.June 6	4:15 p.m.	Grant	(1)	(1)	(1)	0	3	(3)	0	Struck farm area east of Ulysses. Two injured when car blown from road, 1 injured by flying glass.
57.June 6	6 p.m.	Trego	NE	3	400	0	0	40,000	0	At least 4 farms hit south-southwest of Wakeeney.
58.June 6	7:30 p.m.	Grant, Haskell, and Seward	E	2	(1)	0	0	20,000	0	Damage to 4 farms in southeastern Grant County and along Haskell-Seward border.
59.June 6	7:30 p.m.	Pratt	NE	34	(1)	0	0	20,000	5,000)	At least 4 twisters damaged farm houses and barns in Byers, Cullison, Coats, Pratt and Preston.
60.June 6	do	do	do	do	do	0	0		)	
61.June 6	do	do	do	do	do	0	0		)	
62.June 6	do	do	do	do	do	0	0		)	
63.June 6	Evening	Osborne	N	(1)	(1)	0	0	(3)	0	Demolished garage and broke trees in southern Natoma.
64.June 6	10 p.m.	Butler	(1)	(1)	(1)	0	0	3,000	0	Barn and small buildings demolished 12 miles east of Wichita.
65.June 8	1:30 p.m.	Coffey	SE	3/4	600	0	0	(3)	0	Formed 1 mile northwest of Waverly, traveled to town, dipped once.
66.June 8	5 p.m.	Douglas	(1)	(1)	(1)	0	0	750	0	Destroyed a barn 8 miles southwest of Lawrence.
67.June 11	2:30-4 p.m.	Clay	(1)	(1)	(1)	0	0	0	0)	At least 4 funnels sighted aloft near Longford.
68.June 11	do	do	(1)	(1)	(1)	0	0	0	0)	
69.June 11	do	do	(1)	(1)	(1)	0	0	0	0)	
70.June 11	do	do	(1)	(1)	(1)	0	0	0	0)	
71.June 11	3 p.m.	Ellis	(1)	5	(1)	0	0	0	0	Dipped earthward 3 times, but never touched ground; 8 miles south and 20 miles west of Hays.
72.June 11	5:53 p.m.	Graham	NE	5	(5)	0	0	0	0	Seen aloft 60 miles northwest of Hill City.
73.June 15	7:15 p.m.	Shawnee	ENE	1/2	100	0	0	25	100	Destroyed chimney and trees; pulled vegetables from ground southeast of Silver Lake.
74.June 17	Afternoon	Hamilton	(1)	(1)	(1)	0	0	(6)	0)	One of 4 funnels dipped to ground northwest of Syracuse, damaging house and several outbuildings.
75.June 17	do	do	do	do	do	0	0		)	
76.June 17	do	do	do	do	do	0	0		)	
77.June 17	do	do	do	do	do	0	0		)	
78.June 17	10 p.m.	Gove	(1)	(1)	(1)	0	0	(6)	0	Three farms damaged near Quinter.
79.June 19	6-7 p.m.	Clark	(1)	(1)	(1)	0	0	0	0	Seen aloft 15 miles northwest of Ashland prior to severe hail and wind.
80.June 19	11 p.m.	Franklin	(1)	(1)	(1)	0	0	1,000	0	Damaged home and uprooted trees, 10 miles east of Ottawa.
81.June 20	Late afternoon	Comanche	SE	(1)	(1)	0	0	5,000	0	Damage to granary, barn, car, truck, 17 miles southeast of Coldwater.
82.June 20	9:30-10:30 p.m.	Wichita, Scott, and Lane	ENE	50	(1)	0	0	30,000	0	Farm damage south of Leoti, south of Scott City, in and near Dighton.
83.June 21-22	10 p.m.-21st to 3 a.m.-22d	Thomas, Rush, and Osborne	E	(1)	(1)	0	0	5,000	0)	At least 5 tornadoes; 1 at Mingo, 1 near LaCrosse, 3 between Alton and Covert.
84.June 21-22	do	do	do	do	do				)	
85.June 21-22	do	do	do	do	do				)	
86.June 21-22	do	do	do	do	do				)	
87.June 21-22	do	do	do	do	do				)	
88.June 22	Early a.m.	Greenwood	(1)	(1)	(1)	0	0	500	0	Buildings and trees damaged on 2 farms near Eureka.
89.June 23	6:51 a.m.	Graham	(1)	(1)	(1)	0	0	0	0	Observed aloft 20 miles southeast of Hill City; did not touch ground.
90.June 23	10 p.m.	Morton and Stevens	(1)	(1)	(1)	1	4	50,000	0)	One tornado at Rolla; another destroyed 3 hangars at Hugoton Airport.
91.June 23	do	do	do	do	do				)	
92.June 26-27	11:10 p.m.-26th to 12:30 a.m.-27th	Gove and Trego	E	(1)	(1)	5	100	2,000,000	80,000	Destroyed 45 homes, damaged 60 at Wakeeney. Part of extensive hail and windstorm.
93.July 4	6-11 p.m.	Ford	E	(1)	(1)	0	0	2,500	0	Formed in hail and windstorm; damage northeast of Bucklin.
94.July 7	6 p.m.	Rooks	(1)	(1)	(1)	0	0	1,000	0	Roofs and power lines damaged in Palco.
95.July 16	7:30-8:30 p.m.	Brown	(1)	(1)	(1)	0	0	0	0	Sighted aloft north of Hiawatha during windstorm.
96.July 22	12:50 a.m.	Cloud	SE	8	(1)	0	0	2,000	0	Plate glass, roofs, windmills, trees damaged near Aurora.
97.Aug. 6	Afternoon	Ford	(1)	(1)	(1)	0	0	(6)	0	Lifted car from road to ditch; tore down trees in northwestern Bucklin.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
KANSAS (Cont'd.)										
98.Aug. 7	5 p.m.	Morton	(1)	(1)	(1)	0	0	$1,200	$0	Wrecked outbuildings on 2 farms near Wilburton.
99.Aug. 7	9:30 p.m. to midnight	Trego	(1)	(1)	0	0	0	(6)	(6)	Trees uprooted; buildings damaged in southern Trego County.
100.Aug. 10	6:30 p.m.	Cheyenne	E	3	250	0	0	10,000	0	Dipped to ground 3 times; damaged barns, windmills, and windows northeast of St. Francis.
101.Aug. 12	8 p.m.	Phillips	(1)	(1)	(1)	0	0	0	0	Sighted aloft from Long Island.
102.Aug. 23	Night	Rush	(1)	(1)	(1)	0	0	100	0	Removed chicken coop in McCracken.
103.Aug. 24	7:30 a.m.	Franklin	NW	(1)	(1)	0	0	750	0	Damaged farm buildings in northeastern part of county.
104.Aug.24	5:30 p.m.	Rawlins	ENE	4	100	0	0	20,000	0	Buildings demolished on 7 farms in eastern part of county.
105.Aug. 31	2:40-6 p.m.	Russell, Saline, and Dickinson	E	(1)	(1)	0	0	25,000	0)	Four tornadoes; 2 aloft southeast of Russell, 1 in southern Saline County, 1 near Herington.
106.Aug. 31	do	do	do	do	do				)	
107.Aug. 31	do	do	do	do	do				)	
108.Aug. 31	do	do	do	do	do				)	
109.Sept. 23	9:30 p.m.	Rush	E	(1)	(1)	0	0	400	0	Buildings damaged and trees twisted from ground northeast of McCracken.
KENTUCKY										
1. Feb. 20	6 p.m.	Shelby	NE	7	70	0	0	15,000	700	Tornado of bounding type occurred at Bagdad. Several buildings destroyed with damage to crops and livestock.
2. May 11	2-2:30 p.m.	Jefferson	(1)	(1)	(1)	0	0	0	0	Tornado cloud observed northeast of Louisville, but it apparently did not touch ground.
3. Nov. 13	5:50-6 p.m.	Marshall	NE	2	167	1	11	55,000	50,000	Tornado struck at Lakeview and Gilbertsville. Death caused by a large timber blown through house. Tobacco ruined in barns.
LOUISIANA										
1. Jan. 6	5:30 p.m.	Rapides and Grant	N	15	300	0	11	175,000	0	Alexandria to Pollock.
2. Feb. 6	3:50 p.m.	St. Landry	NE	(4)	(5)	0	0	10,000	0	Near Opelousas.
3. Feb. 6	5 p.m.	Tangipahoa	NE	(4)	(5)	0	0	10,000	0	Near Hammond.
4. Apr. 21	(1)	La Salle	(1)	(4)	(5)	0	2	15,000	0	In rural area.
5. Apr. 21	(1)	Ouachita	(1)	(4)	(5)	0	1	8,000	0	In rural area between Chatham and Monroe.
6. Aug. 22	Afternoon	Calcasieu	(1)	(1)	(1)	0	0	5,000	0	Thirteen miles from DeQuincy.
7. Sept. 2	4:15 p.m.	Winn	(1)	1/2	100	0	0	25,000	(6)	Near Winnfield.
8. Sept. 27	10:30 a.m.	Jefferson	W	1	20	0	0	30,000	0	Struck Harvey Packing Plant.
9. Nov. 1	7 a.m.	Orleans	(1)	1/4	100	0	0	15,000	0	At Chef Menteur Fishing Camp.
10.Dec. 5	2 a.m.	Orleans	NE	1/4	200	0	2	750,000	0	In New Orleans; dipped to earth in industrial area after passing over thickly populated section. Wind damage over large area of city, but tornado damage heaviest near Jeff Davis Parkway and New Basin Canal.
MAINE										
(None reported)										
MARYLAND										
(None reported)										
MASSACHUSETTS										
1. Aug. 21	3-3:15 p.m.	Essex	NE	12	100	0	0	2,500	(6)	Described as "twister". Passed through North Andover, Boxford and Byfield; demolished large barn and several garages, one being carried away without a trace of debris.
2. Dec. 18	6-6:30 p.m.	Dukes	NE	(1)	(1)	0	0	7,000	0	"Baby tornado" passed over Ocean Heights, a summer community which was mostly vacant, damaging several buildings.
MICHIGAN										
1. May 3	2:30 p.m.	Livingston	NE	1 1/2	150	0	0	175,000	0	Occurred 2 miles east of Fowlerville, destroying 5 large barns, 3 garages,,utility lines; injured cattle and killed some chickens.
2. June 1	Evening	Eaton	(1)	1/2	8	0	0	2,000	C	One barn destroyed and parts of a field laid flat.

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
MICHIGAN (Cont'd.)										
3. June 26	Evening	Midland	(1)	(4)	(5)	0	0	$20,000	C	Several trees, barns, and 1 house blown down.
4. July 21	11 p.m.	Washtenaw	NE	1/2	220	0	0	10,000	C	Destroyed several farm buildings.
5. Aug. 15	Afternoon	Eaton	NE	3	100	0	0	100,000	C	Two barns blown down, others damaged.
6. Aug. 15	Afternoon	Shiawassee	(1)	(1)	(1)	0	0	120,000	C	Several barns and trees blown down. Utilities interrupted.
7. Aug. 15	Afternoon	Lapeer	(1)	20	300	0	0	50,000	$0	One barn downed and several damaged.
8. Sept. 26	Late evening	Newaygo	(1)	(1)	2/ 2	1	3	(6)	0	Concrete wall of tavern blown down. Steel I-beams carried 100 yards.
MINNESOTA										
*1. June 19	5:30-7:45 p.m.	McLeod, Hennepin, and Anoka	NE	50	330	1	(1)	1,150,000	C)	An icehouse, warehouse, and a number of houses, barns and outbuildings demolished. About 50 city dwellings, buildings, and street carnival concessions damaged. Power and communication lines downed. Hundreds of trees uprooted. Path not continuous.
2. June 19	do	do	do	do	do				)	
3. June 19	do	do	do	do	do				)	
4. June 25	3-3:30 p.m.	Martin	NE	20	167	0	0	100,000	C	Most of the barns and outbuildings on 10 farms demolished; houses and barns moved from their foundations or otherwise damaged. Granaries, silos and windmills, farm machinery and automobiles wrecked or damaged. Much poultry and livestock perished. Poles and wires downed. Hundreds of trees uprooted.
5. July 20	9-9:30 p.m.	Hennepin	E	18	(1)	5	(1)	6,000,000	C	Most damaging tornado of record in Minnesota. About 63 airplanes destroyed and about 37 others damaged. Several hangars, some military barracks, and buildings demolished or severely damaged. Several homes completely wrecked. Property damage extensive in Minneapolis-St. Paul and vicinity. Power and communication lines seriously affected. Hundreds of trees uprooted. Excessively heavy rains caused much flooding; growing crops damaged.
MISSISSIPPI										
1. Feb. 20	Mid-afternoon	Oktibbeha	(1)	(4)	(5)	1	1	5,000	0	Farm home and outbuilding destroyed.
2. Feb. 20	3 p.m.	Lowndes	(1)	(4)	(1)	0	0	12,000	0	
3. Apr. 21	7:25 p.m.	Jasper and Jones	NNE	30	(5)	2	13	50,000	(6)	Greatest damage in Lebanon.
4. Apr. 21	(1)	Smith	(1)	(1)	(1)	0	0	18,000	(6)	
5. June 9	5:30 a.m.	Yazoo	(1)	2	10	0	0	2,000	(6)	Near Holly Bluff.
6. Sept. 10	9:15 a.m.	Lowndes	(1)	1/10	100	0	0	30,000	0	Edge of Columbus.
7. Dec. 8	5:30 p.m.	Warren	(1)	1/2	350	0	0	5,000	0	Twelve miles southeast of Vicksburg.
8. Dec. 20	3:15 p.m.	Winston	(1)	2	900	0	0	20,000	0	At Louisville.
MISSOURI										
1. May 25	Night	Nodaway	(1)	(1)	(1)	0	0	1,500	0	Thirty hogs killed and 40 others injured.
2. June 8	5:45-6:15 p.m.	Phelps	(1)	6	1,000	0	0	5,000	(6)	Possible tornado. Several hundred trees damaged and wires broken. Few buildings affected. Five airplanes at Rolla Airport damaged. Some oats and barley blown down.
3. July 4	1:30 a.m.	Jasper	E	1/8	100	0	1	30,000	0	Accompanied by heavy rain, it moved through West End business and residential districts. Roofs blown off 6 business places and several homes.
4. July 8	7:45-8:30 p.m.	Ray	NE	6	100	0	0	20,000	500	Tornado hit 3 hilltop farms, killing livestock, ruining 2 homes, 5 barns, a garage, 2 autos, and several pieces of farm equipment.
5. July 9	11:30 p.m. - Midnight	Howell	(1)	2	300	0	0	(6)	(6)	Small tornado, accompanied by 1/2-inch hail, ripped down timber and uprooted brush, but did not affect buildings or livestock.
6. Nov. 13	1:30 p.m.	New Madrid	(1)	3	25	0	1	6,000	50	One house destroyed, roofs of house and barn destroyed 3 miles east of Parma; some poultry killed. Hail 1/2 inch reported.
MONTANA										
(None reported)										

See reference notes at end of table.

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
NEBRASKA										
1. Apr. 30	8:55 a.m.	Merrick	NE	1/4	50	0	0	$1,000	$0	In Central City garage wrecked; sides of another garage and barn blown out; porch roof damaged.
2. May 13	Evening	Custer	(1)	(1)	(1)	0	0	2,000	0	In sparsely settled country southwest of Anselmo.
3. May 30	2-3 p.m.	Morrill	(1)	(1)	(1)	0	5	(6)	(6)	Damage not separated from hail.
4. May 30	3-5 p.m.	Chase	(1)	(1)	(1)	0	0	(6)	0	Many buildings lost in east-central Chase County.
5. June 19	4:30-5 p.m.	Sioux	(1)	5	110	0	1	2,500	1,000	Occurred 18 miles north of Harrison.
6. June 25	2:50 p.m.	Cheyenne	N	10	(5)	0	1	(6)	(3)	Hangar, plane, and trailer badly damaged near Sidney.
7. July 7	4-5 p.m.	Perkins	(1)	5	(5)	0	0	2,000	6,000	Small tornado near Madrid.
8. July 13	Evening	Garden	(1)	(4)	(5)	0	0	(6)	(6)	Small tornado 18 miles southwest of Oshkosh accompanied by hailstorm. Damage not separated.
9. Aug. 8	3 p.m.	Morrill	(1)	3	(5)	0	0	5,000	(6)	Small tornado and hailstorm near Bayard.
NEVADA										
(None reported)										
NEW HAMPSHIRE										
1. Aug. 21	3-3:10 p.m.	Rockingham	NE	5	30-40	0	0	4,000	(6)	In Atkinson large barn partially unroofed; cornfields leveled in swath 3 miles long.
NEW JERSEY										
1. Apr. 29	7:15 p.m.	Morris	ESE	1/2	400	0	3	50,000	0	Storm had characteristics of a tornado over small area near Kenvil; 3 persons injured in collapse of plate glass door at filling station.
NEW MEXICO										
1. June 5	2:30 p.m.	Eddy	E	2	(5)	0	0	0	0	Observed from a distance over open range land in Lake Arthur vicinity.
2. Aug. 10	2:30 p.m.	Union	ENE	14	30	0	0	(3)	(3)	Mostly over open fields; some fences torn down southeast of Capulin.
NEW YORK										
(None reported)										
NORTH CAROLINA										
1. June 9	6 p.m.	Franklin	(1)	4	30	0	0	10,000	20,000	Damaged buildings, automobiles, and crops.
2. June 13	4:30 p.m.	Pender	(1)	1	20	0	0	10,000	0	At Surf City buildings and automobiles damaged.
3. July 6	(1)	Brunswick	(1)	(1)	(1)	0	0	7,000	0	Waterspout demolished house on shore at Longbeach.
4. Aug. 9	(1)	Catawba	(1)	1/2	100	0	0	10,000	0	Destroyed grandstand at ball park; uprooted about 200 trees at Hickory.
NORTH DAKOTA										
1. June 14	11:30-11:50 a.m.	Burleigh	E	(1)	(1)	0	0	0	0	Cloud observed 15 miles east of Bismarck. Did not reach ground.
2. Aug. 14	(1)	Grant	(1)	(1)	(1)	0	0	(6)	0	Amount of damage unknown. Occurred west of Elgin; passed between Mott and Burt.
OHIO										
1. Apr. 28	Evening	Hancock and Seneca	(1)	(1)	(1)	0	0	500,000	(3)	Mild tornado with rain; damaged roofs and trees; cars crushed by falling trees, signs, radio antennae, etc. at Findlay, Fostoria, and Tiffin.
2. June 22	5 p.m.	Cuyahoga	(1)	3	100	0	0	500,000	(3)	Tornado funnel tip touched surface in city of Cleveland where large chemical plant was wrecked, several garages demolished, and a few homes damaged.
3. June 27	6-7 a.m.	Butler	NE	(1)	400-500	0	0	0	0	Tornado cloud observed by several persons along path of storm. High winds and heavy rains caused some damage.
OKLAHOMA										
1. Feb. 19	6:30-8 p.m.	Caddo, Canadian, and Kingfisher	NE	45	17	0	5	32,500	0	May have been more than 1 tornado dissipating and reforming. Struck in

See reference notes at end of table.

TORNADO DATA

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
OKLAHOMA (Cont'd.)										
1. Feb. 19 (Cont'd.)										Spring Creek community, Fort Reno, and near Okarche.
2. Feb. 19	10-10:15 p.m.	Cleveland	NE	(1)	100	0	0	$500	$0	Hit ground, then rose immediately south of Norman.
*3. Mar. 27	6:30 p.m.	Woods and Alfalfa	NE	10	(1)	0	0	0	0	Funnel observed by many. Did not touch ground. Moved into Kansas.
4. Apr. 5	1:20-1:40 p.m.	Cleveland	NE	6	125	0	0	20,000	0	School damaged at Newcastle; farm home damaged at Moore.
5. Apr. 5	1:22-1:30 p.m.	Grady	E	1/5	100	0	2	80,000	0	School damaged at Bridge Creek.
6. Apr. 5	4:45 p.m.	Woods	NE	3	33	0	2	5,000	0	Four miles southwest of Waynoka a building and a new truck destroyed.
7. Apr. 24	5:30 p.m.	Custer	(1)	(4)	(5)	0	0	0	0	Struck harmlessly in a pasture.
8. Apr. 24	6:03 p.m.	Jackson	NE	2 1/2	(5)	0	0	3,800	0	Occurred near Duke. One house unroofed; a barn damaged.
9. Apr. 24	Night	Kay	(1)	(4)	(5)	0	0	1,000	0	Six miles southwest of Blackwell; garage destroyed.
10. Apr. 26	7:15 p.m.	Beaver	NE	(4)	(5)	0	0	400	0	Several farm buildings damaged near Beaver City.
11. Apr. 27	2:20 p.m.	Major	(1)	3/4	200	0	2	1,500	0	One farmstead damaged 3 miles southeast of Ringwood.
12. Apr. 30	8:30 p.m.	Stephens	(1)	(4)	(5)	0	0	2,000	0	West of Marlow in Central High and Denton communities; several farm buildings damaged.
13. Apr. 30	9:30 p.m.	Oklahoma	NE	8	200	0	0	150,000	0	From southwestern Oklahoma City to northeastern corner.
14. Apr. 30	9:30 p.m.	Oklahoma	NE	1 1/2	200	0	0	10,000	0	Concurrent with No. 13 in parallel paths about 1 mile apart.
15. May 9	6:30 p.m.	Cotton	(1)	(4)	(5)	0	0	1,000	0	One farmstead damaged 7 miles north and 1 mile west of Walters.
16. May 9	8:20 p.m.	Bryan, Marshall, and Johnston	NNE	15	100	0	1	40,000	0	From western Bryan County through Cumberland Oil Field area in eastern Marshall County to Nida and Kenefick areas in southern Johnston County.
*17. May 14	(1)	Texas	NE	(4)	(5)	0	0	5,000	0)	Two tornadoes observed at same time, Nos. 17 and 18. Total damage for Nos. 17 and 18. Both tornadoes passed into Kansas.
*18. May 14	(1)	Texas	NE	(4)	(5)	0	0	------	)))	
19. May 16	10 a.m.	Beckham	(1)	(4)	(5)	0	0	0	0	Traveled across open field near Erick.
20. May 18	5:30-6 p.m.	Comanche	E	4	(5)	0	0	15,000	0))	Three tornadoes observed at same time, Nos. 20, 21, 22. Total damage for Nos. 20, 21, 22. Moved from Porter Hill to Elgin.
21. May 18	do	do	E	4	(5)	0	0	------	)	
22. May 18	do	do	E	4	(5)	0	0	------	)	
23. May 19	5-6 p.m.	Roger Mills	(1)	(1)	(1)	0	0	0	0)	Three different tornado clouds sighted; did not come to ground. Nos. 23, 24, 25.
24. May 19	do	do	do	do	do	0	0	0	0)	
25. May 19	do	do	do	do	do	0	0	0	0)	
26. May 19	7:15-7:30 p.m.	Beckham	SE	(4)	(5)	0	0	1,000	0	Near Mayfield farm building destroyed.
27. May 19	7:30 p.m.	Dewey	NE	2	70	0	0	2,600	1,000	Farmstead completely demolished. Another damaged 3 miles south of Taloga.
28. May 19	8:12 p.m.	Beckham	SE	(4)	220	0	0	0	0	Lifted immediately after it hit ground; west of Berlin.
29. June 5	(1)	Texas	(1)	(4)	(5)	0	0	1,000	0	Occurred north of Texhoma.
30. June 6	9:30 p.m.	Greer	N	1/5	30	0	0	400	0	Farmstead damaged 2 miles southeast of Mangum.
31. June 6-7	11:50 p.m. -12:45 a.m.	Grady	(1)	3	440	0	0	1,500	0	Nearly every building in Cox City suffered some damage.
32. June 7	5 p.m.	Tillman	SE	1/2	100	0	0	6,000	0	Farmstead damaged near Manitou.
33. June 7	6:15 p.m.	Roger	(1)	5	33	0	1	30,000	0	Damage to 5 barns; other damage to smaller buildings at Oolagah.
34. June 7	10:55 p.m.	Muskogee	(1)	(4)	(5)	0	1	(6)	0	One house demolished; 9 houses damaged at McLain.
35. June 8	6:30-7 p.m.	Washita	ESE	15	100 to 1,320	0	0	354,000	0	Two funnels converged just before striking town of Corn.
36. June 8	7:14 p.m.	Kay	(1)	1/4	200	0	0	7,500	0	Damage to airport hangar at Tonkawa.
37. June 8	7:15 p.m.	Tillman	(1)	(4)	(5)	0	0	1,000	0	Farmstead demolished west of Chattanooga.
38. June 20	11:20 p.m.	Major	(1)	(4)	(5)	0	0	75,000	0	A number of barns, granaries, and other buildings damaged from Meno to Isabelle and Ames.
39. June 21	Late afternoon	Cimarron	NE	(4)	(5)	0	0	5,000	0	Near Felt.
40. July 15	4:20 p.m.	Kingfisher	(1)	(4)	100	0	0	(3)	0	Three funnels in same cloud. Some damage near Okeene.
41. July 27	3:30-4:30 p.m.	Ellis	(1)	10	440	0	0	2,000	0	Two barns damaged west of Arnett.
42. Aug. 10	1:57 p.m.	Logan	NNE	5	200	0	2	20,000	2,000	At Meridian.
43. Aug. 31	3:50 p.m.	Woods	SE	1/2	440	0	0	2,000	0	Near Alva.
44. Sept. 9	4:20 p.m.	Craig and Delaware	E	1	67	0	0	3,000	1,000	Damage at Ironside school and near Cleora.
45. Oct. 21	8:30 p.m.	Noble	E	2	880	0	0	5,000	0	At Bressie Township, 8 miles southwest of Redrock.

See reference notes at end of table.

TORNADO DATA

Table 11—Continued

YEAR 1951

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons: Killed	Number of persons: Injured	Estimated damage: Property (exclusive of crops)	Estimated damage: Crops	Remarks
OREGON										
1. Dec. 6	3:40 p.m.	Lane	SW	3/10	50	0	0	(3)	$0	Quite small and not too well formed; duration only 13 minutes. Fairly large hail occurred. Only building in its path was a small machine shed which was demolished near Eugene.
PENNSYLVANIA										
1. Mar. 30	4 p.m.	Adams	(1)	(1)	(1)	0	0	$1,000	0	Near Gettysburg house unroofed during heavy rain.
2. May 11	Afternoon	(Hit-skip thru (Cambria, (Somerset, In- (diana, Bed- (ford, and (Blair	E	(1)	(1)	0	1	(6)	0))))))	Tree and wire damage, auto damaged; farm buildings damaged and destroyed. One area of damage near Friedens, second area of damage Canoe Creek Valley.
3. May 11	do		E							
4. June 27-28	10:30 p.m. - 1 a.m.	Armstrong and Indiana	E	5	(1)	0	0	(6)	0	Two barns unroofed, 2 silos demolished; trees uprooted and thrown against homes and across highways. Wires down. Began in Dayton, moved to Smicksburg.
5. July 19	11:45 a.m.	Montgomery	E	(4)	100	0	0	(3)	(3)	Through Maple Glen; uprooted trees and flattened corn.
6. July 19	Afternoon	Chester and Philadelphia	E	(4)	(1)	0	0	(3)	0	Felled trees along Sackville section of Brookhaven Road.
7. July 21	Noon	Bradford	(1)	(4)	(1)	0	0	(3)	(3)	Small twister reported along Hemlock Run.
RHODE ISLAND										
(None reported)										
SOUTH CAROLINA										
(None reported)										
SOUTH DAKOTA										
1. July 8	(1)	Grant	(1)	(1)	(1)	(1)	(1)	(3)	0	Damage to 1 farm building near Milbank.
2. July 20	(1)	Clark-Codington	(1)	(1)	(1)	(1)	(1)	(6)	0	Tornado accompanied by heavy thunderstorm, high winds, and rain.
TENNESSEE										
1. Nov. 14	10 p.m.	Giles	(1)	(1)	(1)	0	0	(6)	(6)	One home destroyed and 6 damaged; 2 outbuildings destroyed and 1 damaged.
TEXAS										
1. Mar. 28	5:10 a.m.	Houston	NE	(1)	(1)	0	0	2,500	1,300	Farm homes damaged 8 miles west of Crockett.
2. Apr. 20	3:10 p.m.	Wichita	NE	(4)	25	0	0	8,000	0	At Wichita Falls 2 homes destroyed, others damaged.
3. May 9	5 p.m.	Wichita	ENE	12	(1)	0	1	(6)	(6)	Tornado, severe wind and hail; estimate impossible. $200,000 in Iowa Park alone. Wind and hail 95 percent, tornado 5 percent.
4. May 15	6:30 p.m.	Castro	NE	(4)	(5)	0	0	(6)	0	Buildings on 2 farms damaged at Flagg.
5. May 18	3:45 p.m.	Archer	E	(1)	200	2	100	(6)	(6)	150 homes destroyed or damaged at Olney.
6. May 24	5 p.m.	Haskell	ESE	10	(1)	1	0	(6)	(6)	Small tornado; heavy wind and hail storms; occurred at Rochester.
7. May 31	4 p.m.	Hutchinson	(1)	(1)	(1)	0	0	(3)	(3)	Two farm homes damaged at Borger.
8. June 6	6:20 p.m.	Potter	E	(1)	(1)	0	0	0	0	Tornado occurred 5 miles northwest of KGNC radio station near Amarillo.
9. June 6	6:50 p.m.	Carson	(1)	32	(1)	0	0	(6)	0	Funnel touched ground southwest of Borger.
10. June 6	8:06 p.m.	Carson	SE	32	200	0	12	1,500,000	0	Property damage in White Deer.
11. June 6	8:40 p.m.	Gray	SE	32	(1)	0	0	(3)	0	Utility lines damaged south of Pampa.
12. June 6	8:50 p.m.	Childress	SE	2	880	0	0	(6)	0	Four farm homes destroyed northeast of Childress.
13. June 15	10:20 p.m.	Taylor	E	5	(5)	0	6	180,000	0	Damage to buildings in Merkel.
14. June 16	12:30 a.m.	Johnson	E	15	(5)	0	0	12,000	0	Damage to homes in Joshua.
15. July 2	12:15 a.m.	Lamb	E	(4)	(5)	0	0	(6)	(6)	Grain elevator destroyed at Olton.
UTAH										
(None reported)										
VERMONT										
(None reported)										

See reference notes at end of table.

Table 11—Continued

TORNADO DATA

YEAR 1951

State and date	Hour	County	Direction of advance	Length of path, miles	Width of path, yards	Number of persons		Estimated damage		Remarks
						Killed	Injured	Property (exclusive of crops)	Crops	
VIRGINIA										
1. Feb. 1	2 p.m.	Appomattox	NE	(4)	50	0	0	$1,500	$0	Funnel touched earth for 1 to 2 minutes.
2. May 11	Late afternoon	King and Queen	(1)	(1)	(1)	0	0	(6)	(6)	Barn and outbuildings demolished. Roofs and chimneys damaged; telephone service disrupted in Shackleford's section.
3. June 13	4:05 p.m.	City of Richmond	NE	4	350	0	12	500,000	0	Severe damage from Byrd Park to Monroe Park. More than 600 families suffered damage to some degree.
4. June 27	Afternoon	Warwick	(1)	(1)	(1)	0	0	1,000	(6)	Garage destroyed; many trees uprooted.
5. Nov. 1	7:40 a.m.	York	NE	(1)	230	0	0	4,500	0	Storage building blown down at Yorktown Battlefield.
WASHINGTON										
1. Oct. 2	3:10-3:40 p.m.	Clark	E	8	35	0	0	10,000	(3)	Just north of town of Battleground.
WEST VIRGINIA										
1. June 26	3:30 p.m.	Wood	E	1/4	330	0	0	4,000	100	Waterspout observed in Ohio River as storm crossed river.
WISCONSIN										
1. June 19	8:30 p.m.	Dodge	NE	1	500	0	0	25,000	(3)	Occurred near Brownsville. Large barn demolished, other farm buildings damaged. Large trees snapped off.
2. July 3	8 p.m.	Richland	NE	1/2	50	0	0	10,000	0	Barn demolished near Cazenovia.
3. Sept. 12	11:30 a.m.	Pepin and Dunn	NE	30	200	0	2	127,000	(3)	Greatest destruction 6 miles east of Menomonie. At least 8 large barns destroyed.
4. Sept. 26	3:50 a.m.	Waupaca	NE	20	100	6	3	250,000	(3)	Most destruction 3 miles north of Waupaca; 5 members of one family killed. Buildings on several farms demolished.
5. Sept. 26	4:30 p.m.	Columbia	NE	10	100	1	10	225,000	(3)	Occurred near Cambria. A house and several barns destroyed. Trees 18 inches in diameter pulled out by roots.
WYOMING										
1. May 7	12:25 p.m.	Uinta	(1)	(1)	(1)	0	0	0	0	Funnel failed to reach ground; sighted near Fort Bridger.
ALASKA										
(None reported)										
HAWAII										
(None reported)										
WEST INDIES										
(None reported)										

* Denotes State-boundary crossing tornado.
C Damage to crops.
1/ Datum not obtained.
2/ Miles instead of yards.
3/ Amount of damage described as small; no definite monetary estimate.
4/ Short.
5/ Narrow.
6/ Losses occurred; amount not reported.

Table 12

TORNADO SUMMARY

YEAR 1951

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
ALABAMA													
Number		1				1					3		5
Days		1				1					1		3
Deaths		0				0					0		0
Injuries		2				2					9		13
Damage		$50,000				$5,000					$32,500		$87,500
ARIZONA													
Number								2					2
Days								2					2
Deaths								0					0
Injuries								0					0
Damage								0					0
ARKANSAS													
Number		1								1			2
Days		1								1			2
Deaths		0								0			0
Injuries		3								4			7
Damage		1/32,500								(2)			1/32,500
CALIFORNIA													
Number	2												2
Days	1												1
Deaths	0												0
Injuries	0												0
Damage	$ 1,550,000												1,550,000
COLORADO													
Number					2	4							6
Days					2	4							6
Deaths					0	0							0
Injuries					0	2							2
Damage					$75,000	69,500							144,500
CONNECTICUT													
Number								2					2
Days								2					2
Deaths								0					0
Injuries								9					9
Damage								$ 1/135,000					1/135,000
DELAWARE													
(None)													
DISTRICT OF COLUMBIA													
(None)													
FLORIDA													
Number			2		2		2					5	11
Days			1		1		2					2	6
Deaths			0		3		0					0	3
Injuries			0		0		0					0	0
Damage			$45,000		1/75,000		$2,000					1/$55,500	1/177,500
GEORGIA													
Number					2						1		3
Days					1						1		2
Deaths					0						0		0
Injuries					0						0		0
Damage					25,600						1,000		26,600
IDAHO													
(None)													
ILLINOIS													
Number						2					2	1	5
Days						1					1	1	3
Deaths						1					0	1	2
Injuries						50					9	1	60
Damage						2,255,000					163,500	217,000	2,635,500
INDIANA													
Number			1			1	1				1		4
Days			1			1	1				1		4
Deaths			0			0	0				0		0
Injuries			2			4	0				0		6
Damage			100,000			800,000	102,000				300,000		1,302,000
IOWA													
Number						3	1	1					5
Days						3	1	1					5
Deaths						1	0	0					1
Injuries						15	2	0					17
Damage						1/ 6,610,000	109,000	1/11,000					1/6,730,000
KANSAS													
Number			3	8	41	40	4	12	1				109
Days			3	4	10	13	4	7	1				42
Deaths			0	0	1	6	0	0	0				7
Injuries			0	0	4	1/107	0	0	0				1/111
Damage			1/500	1/$58,000	1/293,000	1/ 2,261,375	5,500	1/57,050	$400				1/2,675,825
KENTUCKY													
Number		1			1						1		3
Days		1			1						1		3
Deaths		0			0						1		1
Injuries		0			0						11		11
Damage		15,700			0						105,000		120,700
LOUISIANA													
Number	1	2		2				1	2		1	1	10
Days	1	1		1				1	2		1	1	8
Deaths	0	0		0				0	0		0	0	0
Injuries	11	0		3				0	0		0	2	16
Damage	175,000	20,000		23,000				5,000	1/55,000		15,000	750,000	1/1,043,000
MAINE													
(None)													
MARYLAND													
(None)													
MASSACHUSETTS													
Number								1				1	2
Days								1				1	2
Deaths								0				0	0
Injuries								0				0	0
Damage								1/2,500				7,000	1/9,500

See reference notes at end of table.

Table 12—Continued

TORNADO SUMMARY

YEAR 1951

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
MICHIGAN													
Number					1	2	1	3	1				8
Days					1	2	1	1	1				6
Deaths					0	0	0	0	1				1
Injuries					0	0	0	1/ 0	3				3
Damage					$175,000	1/$22,000	1/$10,000	$270,000	(2)				1/$477,000
MINNESOTA													
Number						4	1						5
Days						2	1						3
Deaths						1	5						6
Injuries						1/ (3)	1/ (3)						(3)
Damage						1,250,000	6,000,000						1/7,250,000
MISSISSIPPI													
Number		2		2		1			1			2	8
Days		1		1		1			1			2	6
Deaths		1		2		0			0			0	3
Injuries		1		13		0			0			0	14
Damage		$17,000		1/$68,000		1/2,000			$30,000			$25,000	1/142,000
MISSOURI													
Number					1	1	3				1		6
Days					1	1	3				1		6
Deaths					0	0	0				0		0
Injuries					0	0	1				1		2
Damage					1,500	1/5,000	1/50,500				$6,050		1/ 63,050
MONTANA													
(None)													
NEBRASKA													
Number				1	3	2	2	1					9
Days				1	2	2	2	1					8
Deaths				0	0	0	0	0					0
Injuries				0	5	2	0	0					7
Damage				1,000	1/ 2,000	1/3,500	1/8,000	1/ 5,000					1/ 19,500
NEVADA													
(None)													
NEW HAMPSHIRE													
Number								1					1
Days								1					1
Deaths								0					0
Injuries								0					0
Damage								1/4,000					1/4,000
NEW JERSEY													
Number				1									1
Days				1									1
Deaths				0									0
Injuries				3									3
Damage				50,000									50,000
NEW MEXICO													
Number						1		1					2
Days						1		1					2
Deaths						0		0					0
Injuries						0		0					0
Damage						0		(4)					(4)
NEW YORK													
(None)													
NORTH CAROLINA													
Number						2	1	1					4
Days						2	1	1					4
Deaths						0	[illegible]	0					0
Injuries						0	0	0					0
Damage						40,000	7,000	10,000					57,000
NORTH DAKOTA													
Number						1		1					2
Days						1		1					2
Deaths						0		[illegible]					0
Injuries						0		0					0
Damage						0		(2)					(2)
OHIO													
Number				1		2							3
Days				1		2							3
Deaths				0		0							0
Injuries				0		0							0
Damage				1/500,000		1/500,000							1/1,000,000
OKLAHOMA													
Number		2	1	11	14	11	2	[illegible]	1	1			45
Days		1	1	5	5	6	2	2	1	1			24
Deaths		0	0	0	0	0	0	0	0	0			0
Injuries		5	0	6	1	2	0	2	0	0			16
Damage		33,000	$0	273,700	65,600	1/481,400	1/ 2,000	24,000	4,000	$5,000			1/ 888,700
OREGON													
Number												1	1
Days												1	1
Deaths												0	0
Injuries												0	0
Damage												(4)	(4)
PENNSYLVANIA													
Number			1		2	1	3						7
Days			1		1	2	[illegible]						6
Deaths			0		0	0	0						0
Injuries			0		1	0	0						1
Damage			1/1,000		(2)	(2)	(4)						1/ 1,000
RHODE ISLAND													
(None)													
SOUTH CAROLINA													
(None)													
SOUTH DAKOTA													
Number							2						2
Days							2						2
Deaths							0						0
Injuries							0						0
Damage							(2)						(2)

See reference notes at end of table.

Table 12—Continued

TORNADO SUMMARY

YEAR 1951

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
TENNESSEE													
Number											1		1
Days											1		1
Deaths											0		0
Injuries											0		0
Damage											(2)		(2)
TEXAS													
Number			1	1	5	7	1						15
Days			1	1	5	3	1						11
Deaths			0	0	3	0	0						3
Injuries			0	0	101	18	0						119
Damage			$3,800	$8,000	(2)	$ 1/ 1,692,000	(2)						1/1,703,800
UTAH													
(None)													
VERMONT													
(None)													
VIRGINIA													
Number		1			1	2					1		5
Days		1			1	2					1		5
Deaths		0			0	0					0		0
Injuries		0			0	12					0		12
Damage		$1,500			(2)	1/501,000					$4,500		1/ 507,000
WASHINGTON													
Number										1			1
Days										1			1
Deaths										0			0
Injuries										0			0
Damage										1/$10,000			1/ 10,000
WEST VIRGINIA													
Number						1							1
Days						1							1
Deaths						0							0
Injuries						0							0
Damage						4,100							4,100
WISCONSIN													
Number						1	1		3				5
Days						1	1		2				4
Deaths						0	0		7				7
Injuries						0	0		15				15
Damage						1/ 25,000	$10,000		1/$602,000				1/ 637,000
WYOMING													
Number					1								1
Days					1								1
Deaths					0								0
Injuries					0								0
Damage					0								0
ALASKA													
(None)													
HAWAII													
(None)													
WEST INDIES													
(None)													
TOTALS													
Number	3	10	9 *8	27	76 *74	90 *89	25	29	9	3	12	11	304 *300
Days	2	7 †4	8 †7	15 †9	32 †21	52 †22	24 †17	22 †16	8 †7	3	9 †5	8 †6	190 †119
Deaths	0	1	0	2	7	9	5	0	8	0	1	1	34
Injuries	11	11	2	25	112	1/ 214	3	11	15	4	30	3	1/ 444
Damage	$ 1,725,000	1/$169,700	1/$150,300	1/$981,700	1/$712,700	1/ $16,526,875	1/ $6,306,000	1/$523,550	1/$691,400	1/$15,000	1/$627,550	1/ $1,054,500	1/ $29,484,275

* Corrected for boundary-crossing tornado.
† Tornado days for country as a whole.
1. Additional losses occurred.
2. Losses occurred; amount not reported.
3. Datum not obtained.
4. Amount of damage described as small; no definite monetary estimate.

NUMBER OF TORNADOES, TORNADO DAYS, AND RESULTING LOSSES BY YEARS, 1916-51

Table 13.

Year	Number reported	Number tornado days	Total loss of life	Most deaths in a single tornado	Total reported property losses	Number of tornadoes causing losses of	
						$100,000	$1,000,000
1916---	90	36	150	30	$2,264,500	6	1
1917---	121	38	509	101	15,007,700	22	5
1918---	81	45	135	36	7,431,150	19	1
1919---	65	35	206	59	6,861,500	9	2
1920---	87	49	498	87	15,007,500	24	7
1921---	106	55	202	61	5,456,300	13	1
1922---	108	65	135	16	6,880,000	20	0
1923---	102	59	109	23	2,968,725	8	0
1924---	130	58	376	85	26,072,350	25	6
1925---	119	64	794	689	24,039,900	29	1
1926---	111	56	144	23	4,323,950	16	0
1927---	164	63	540	92	43,455,650	28	7
1928---	203	79	92	14	13,235,600	25	4
1929---	197	73	274	40	10,112,400	30	1
1930---	192	72	179	41	12,289,100	28	3
1931---	94	57	36	6	3,215,900	7	1
1932---	152	67	394	37	8,888,525	11	1
1933---	260	96	362	34	16,190,640	31	5
1934---	147	77	47	6	4,424,950	9	0
1935---	182	77	70	11	4,661,430	15	0
1936---	159	73	552	216	26,228,550	17	6
1937---	148	76	29	5	3,155,875	11	0
1938---	220	78	183	32	8,793,457	18	3
1939---	155	75	87	27	5,891,930	10	2
1940---	128	65	65	18	6,015,320	9	1
1941---	118	57	53	25	4,492,650	15	0
1942---	170	68	384	65	15,268,950	32	3
1943---	155	63	58	5	12,198,400	25	4
1944---	173	67	275	100	21,594,150	34	7
1945---	126	68	210	69	22,069,800	25	8
1946---	109	66	78	15	12,267,015	31	3
1947---	171	80	313	169	23,994,680	42	5
1948---	190	74	140	33	40,699,650	53	6
1949---	262	84	212	58	27,367,380	45	7
1950---	209	91	70	18	13,602,340	31	1
1951---	300	119	34	6	29,484,275	27	7
Sum----	5,504	2,425	7,995	---	$505,912,192	800	109
Mean---	152.9	67.4	222.1	---	14,053,116	---	---

HAILSTORM LOSSES

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Alabama														
Arizona														$25,000
Arkansas							1/$270,500	1/$100,000	1/$36,000	(2)	(2)	1/$51,000		
California								1,000,000						
Colorado									123,850	$108,500	3/$251,500	483,000	$5,000	142,700
Dist. of Columbia														
Florida								(4)	(4)	(2)				
Georgia									100	109,300				
Idaho										(4)		(4)		(2)
Illinois										15,000	1,000	35,000		(4)
Indiana											5,000		20,000	3,000
Iowa							102,000				1/510,000	1/1,750,000	(2)	1/80,000
Kansas					(2)		50,000		1/2,714,000	1/4,026,000	1/13,413,850	1/9,866,300	11,000	223,500
Kentucky														
Louisiana							50,000	(4)						
Maryland-Delaware										3,000		1/4,000		
Michigan									(4)	6/420	(4)	6/11,000	1/10,000	6/49,800
Minnesota											7/50,000	1/7/175,000	1/64,500	316,000
Mississippi														
Missouri											1/12,100	1/19,100		
Montana											(4)	1/1,064,000	1/530,000	1/2,252,500
Nebraska									534,500	1/190,500	1/2,344,200	1/5,505,000	37,500	265,000
Nevada														
New England											(2)			7/134,000
New Jersey									10,000	30,000	3,000	5,000	3,000	5,000
New Mexico									3/500,000		105,500	406,000	(2)	35,000
New York													10,000	3,000
North Carolina									33,000	312,000	83,000	3,600,000	25,000	850,000
North Dakota											5,000	250,000	35,000	1,400,000
Ohio									125,050	300,500	55,000	(4)		
Oklahoma			$100,500				1,500	20,500	9,500	446,000	568,450	1,580,500		1,000
Oregon														
Pennsylvania									(2) (7)	(2)	5,000	3,000	(4)	(7)
South Carolina										8,000				7,500
South Dakota												(2)	5,000	100,000
Tennessee														
Texas						$10,000	65,000	131,450	(2)	(2)	1,335,000	40,000		(2)
Utah														15,000
Virginia									1,350	273,100			3,000	177,500
Washington														
West Virginia										2,000		(2)	3/27,500	
Wisconsin											10,000	70,000		(2)
Wyoming										600	35,740	110,000	(4)	60,000
Alaska														
Hawaii														
West Indies														
Total	$ 0	$ 0	$100,500	$ 0	(2)	$10,000	1/$539,000	$ 1/1,251,950	$ 1/3/7/4,087,350	$ 1/6/5,824,920	$ 1/18,793,340	$ 1/6/7/25,027,900	1/ 3/$786,500	$ 1/6/7/6,145,500

HAILSTORM LOSSES

Table 14–Continued

Section	August		September		October		November		December		Crop season April–Sept.		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Alabama											$ 0	$ 0	$ 0	$ 0	$ 0
Arizona		$250		$5,000							0	30,250	0	30,250	30,250
Arkansas											1/306,500	1/151,000	1/306,500	1/151,000	1/457,500
California											0	1,000,000	0	1,000,000	1,000,000
Colorado	$184,500	71,250	$830,000	410,000							3/1,394,850	1,215,450	3/1,394,850	1,215,450	2,610,300
Dist. of Columbia											0	0	0	0	0
Florida											(4)	(2)	(4)	(2)	(2)
Georgia											100	109,300	100	109,300	109,400
Idaho	1,200	185,000									1,200	1/185,000	1,200	1/185,000	1/186,200
Illinois							$1,000				1,000	1/50,000	2,000	1/50,000	1/52,000
Indiana	50,000	250,000									75,000	253,000	75,000	253,000	328,000
Iowa	(2)	(2)	(4)	(4)							1/612,000	1/1,830,000	1/612,000	1/1,830,000	1/2,442,000
Kansas	85,000	852,500	1/76,500	3,150	$7,500	$4,000					1/16,350,350	1/14,971,450	1/16,357,850	1/14,975,450	1/31,333,300
Kentucky									$2,500		0	0	2,500	0	2,500
Louisiana											50,000	(4)	50,000	(4)	1/50,000
Maryland-Del.	5/50,000	(4)									5/50,000	1/7,000	5/50,000	1/7,000	1/5/57,000
Michigan	1/10,000	6/7,475		6/6,200							1/20,000	6/74,895	1/20,000	6/74,895	1/6/94,895
Minnesota	20,000	30,000	62,000	30,000							1/7/196,500	1/7/551,000	1/7/196,500	1/7/551,000	1/7/747,500
Mississippi											0	0	0	0	0
Missouri	1/7,000	1/81,200									1/19,100	1/100,300	1/19,100	1/100,300	1/119,400
Montana	(2)	1/1,204,000	1/5,000	1/154,000							1/535,000	1/4,674,500	1/535,000	1/4,674,500	1/5,209,500
Nebraska	17,000	1,409,000	110,000	375,000	200,000	(4)					1/3,043,200	1/7,744,500	1/3,243,200	1/7,744,500	1/10,987,700
Nevada											0	0	0	0	0
New England	(2)	1/1,000	(2)	(2)							(2)	1/7/135,000	(2)	1/7/135,000	1/7/135,000
New Jersey	1,000	2,000									17,000	42,000	17,000	42,000	59,000
New Mexico	1/1,000	(4)									1/3/606,500	1/441,000	1/3/606,500	1/441,000	1/1,047,500
New York	(2)	(2)									1/10,000	1/3,000	1/10,000	1/3,000	1/13,000
North Carolina	5,000	220,000									146,000	4,982,000	146,000	4,982,000	5,128,000
North Dakota	75,000	3,000,000		500,000		13,000					115,000	5,150,000	115,000	5,163,000	5,278,000
Ohio	(4)	(4)									1/180,050	1/300,500	1/180,050	1/300,500	1/480,550
Oklahoma			11,000	150,000	70,000	176,500					590,450	2,198,000	760,950	2,374,500	3,135,450
Oregon											0	0	0	0	0
Pennsylvania	(4)	(2)									1/7/5,000	1/7/3,000	1/7/5,000	1/7/3,000	1/7/8,000
South Carolina											0	15,500	0	15,500	15,500
South Dakota		50,000									5,000	1/150,000	5,000	1/150,000	1/155,000
Tennessee			102,500								102,500	0	102,500	0	102,500
Texas		1,500,000									1/1,400,000	1/1,671,450	1/1,400,000	1/1,681,450	1/3,081,450
Utah											0	15,000	0	15,000	15,000
Virginia											4,350	450,600	4,350	450,600	454,950
Washington											0	0	0	0	0
West Virginia											3/27,500	1/2,000	3/27,500	1/2,000	1/29,500
Wisconsin											10,000	1/70,000	10,000	1/70,000	1/80,000
Wyoming	(4)	15,000	125,000	50,000							1/160,740	235,600	1/160,740	235,600	1/396,340
Alaska											0	0	0	0	0
Hawaii											0	0	0	0	0
West Indies											0	0	0	0	0
Total	1/5/$506,700	$ 1/6/8,878,675	$ 1/1,322,000	$ 1/6/1,683,350	$277,500	1/$193,500	$1,000	$ 0	$2,500	$ 0	1/3/5/7/$26,034,890	1/6/7/$48,812,295	1/3/5/7/$26,416,390	1/6/7/$49,015,795	1/5/6/7/$75,432,185

1. Additional losses incurred; no accurate estimate obtained.
2. Losses incurred; amount not reported.
3. Includes crop damage.
4. Damage reported to be small.
5. Considerable damage from attendant winds.
6. Estimated from reports of insurance companies.
7. Considerable damage from attendant heavy rains.

Table 15

HAILSTORM LOSSES FOR PAST YEARS

Year	Property (exclusive of crops)	Crops	Total
1933			$6,773,810
1934			11,390,405
1935			9,471,401
1936	$1,953,870	$9,053,168	11,007,038
1937	1,797,355	10,991,938	12,789,293
1938	2,634,700	12,170,180	14,804,880
1939	358,850	3,153,670	3,512,520
1940	2,245,925	7,162,428	9,408,353
1941	1,854,571	11,449,108	13,303,679
1942	1,513,475	16,407,588	17,921,063
1943	3,149,220	33,854,174	37,003,394
1944	$9,060,975	$49,987,901	$59,048,876
1945	3,608,170	31,513,464	35,121,634
1946	9,783,775	30,382,033	40,165,808
1947	3,829,320	54,348,839	58,178,159
1948	12,163,200	56,180,814	68,344,014
1949	6,336,400	41,646,610	47,983,010
1950	21,072,845	28,094,502	49,167,347
1951	26,416,390	49,015,795	75,432,185
Total	107,779,041	445,412,212	580,826,869
Mean	6,736,190	27,838,263	32,268,159

WINDSTORM LOSSES

Table 16

(Windstorms other than tornadoes)

YEAR 1951

Section	January		February		March		April		May		June		July	
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops
Alabama			$156,000						$275,000		$2,500			
Arizona													1/ $50,600	
Arkansas					2/ $40,000	2/ $10,000	(3)	(3)	(3)	(3)	2/ 155,500	(3)		
California	$100,000						$300,000							
Colorado	4,000								13,750	$21,250	4/ 20,000		5,000	$47,500
District of Columbia											3,500			
Florida					950		3,000		13,500	(3)	2,500		(3)	
Georgia			1,500						1,250	1,000	30,000			
Idaho	(3)				(3)									
Illinois			25,000				50,000	(3)	16,000		265,000	$ 2/ 2,364,000	2/ 95,000	2/ 110,000
Indiana	9,000		2,000		1,000		42,000		150,000	5,000	450,000	7,000	40,000	1,000
Iowa									2/ 72,400		5/ 80,000	5/ 107,000	200,000	(3)
Kansas					185,000	(3)			2/ 41,500		2/ 659,750	2/ 21,000	128,600	32,000
Kentucky			4/ 255,000						2/ 11,000	1,000	1,000			
Louisiana									25,000		57,500			
Maryland-Delaware			(3)		10,000						(3)		(3)	
Michigan											200,000	(3)	2/ 196,000	(3)
Minnesota							500		3,000		2/ 10,000		1,025,000	(3)
Mississippi							112,000							
Missouri			60,000		7,000				(3)	590,000	2/ 73,000	2/ 12,000	2/ 33,000	
Montana	(3)		(3)		10,000									
Nebraska									16,000	50,000	800			
Nevada														
New England			1/ 500,000				(3)		(3)	(3)	(3)	(3)	5/ 1/ 768,000	5/ 1/ 500,000
New Jersey	30,000		40,000		60,000		75,000		50,000	5,000	40,000	5,000	50,000	5,000
New Mexico														
New York													1/ 500,000	1/ 500,000
North Carolina			5,000								(3)			
North Dakota							5,000		45,000	7,000			50,000	25,000
Ohio														
Oklahoma			62,000		4,000		44,300		106,000	1,000	1,991,500	121,000	2,000	
Oregon	200,000	(3)												
Pennsylvania					(3)				(3)		(3)		(3)	(3)
South Carolina							2,500		4,000	5,000	67,800		15,750	
South Dakota													75,000	20,000
Tennessee									2,500	500	200		43,000	7,000
Texas	500		12,000					$18,750	2/ 800,000	2/ 25,000	1,530,000	30,000	2,000	
Utah														
Virginia			1,000		1,000		(3)		153,200		30,350	3,000	210,800	300
Washington	460,000		250,000		(3)	(3)					(3)	(3)	(3)	(3)
West Virginia									2/ 1,500		2/ 4,600	2/ 100		
Wisconsin			(3)								305,000	(3)	1/ 2,210,000	1/ 550,000
Wyoming					8,000									(3)
Alaska	4,000		25,000		12,600		500		200					
Hawaii	250,000	$200,000			2/ 40,000	(3)								
West Indies			(3)	(3)										
Total	$ 2/ 1,057,500	2/ $200,000	$ 2/ 4/ 1,394,500	(3)	2/ $379,550	2/ $10,000	2/ $634,800	2/ $18,750	$ 2/ 1,800,800	2/ $711,750	$ 2/ 4/ 5/ 5,980,500	$ 2/ 5/ 2,670,100	$ 1/ 2/ 5/ 5,699,750	1/ 2/ 5/ $1,797,800

See reference notes at end of table.

WINDSTORM LOSSES

Table 16 —Continued

(Windstorms other than tornadoes)

YEAR 1951

Section	August		September		October		November		December		Crop season April–Sept.		Total		
	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property	Crops	Property and crops
Alabama	$3,000										$280,500	$0	$436,500	$0	$436,500
Arizona	10,175								1/ $6,900		1/60,775	0	1/67,675	0	1/67,675
Arkansas			2/ $3,000	2/ $2,000							2/ 158,500	2/ 2,000	2/ 198,500	2/ 12,000	2/ 210,500
California											300,000	0	400,000	0	400,000
Colorado	13,000	$12,250									4/ 51,750	81,000	4/ 55,750	81,000	136,750
Dist.of Columbia											2/ 3,500	0	2/ 3,500	2/ 0	2/ 3,500
Florida					$400,000	$ 1,600,000					19,000	(3)	419,950	1,600,000	2,019,950
Georgia									5,000		31,250	1,000	37,750	1,000	38,750
Idaho						3,500					2/ 0	2/ 0	(3)	2/ 3,500	2/ 3,500
Illinois			15,000	(3)			$500,000				441,000	2,474,000	2/ 966,000	2,474,000	2/ 3,440,000
Indiana	140,000	200,000			25,000		125,000	$4,000			2/ 822,000	213,000	2/ 984,000	2/ 217,000	2/ 1,201,000
Iowa	2/ (3)	2/ (3)					(3)				2/ 352,400	2/ 107,000	2/ 352,400	2/ 107,000	2/ 459,400
Kansas	1 180,400	401,000	13,500		23,700	5/ 8,000					1,023,750	2/ 454,000	1,232,450	5/ 462,000	2/ 1,694,450
Kentucky	86,500	5/63,000			1,000	5,000	8,000	2,500	5,000		2/1/4/98,500	5/ 64,000	2/1/4/367,500	71,500	1/2/5/439,000
Louisiana	280,000	(3)									362,500	(3)	2/ 362,500	(3)	2/362,500
Maryland-Del.	2/ 50,000	(3)							100,000		2/ 50,000	2/ (3)	2/ 160,000	2/ (3)	2/160,000
Michigan	46,000	1,000	(3)	(3)	(3)	(3)					2/ 442,000	1,000	2/ 442,000	1,000	2/ 2/443,000
Minnesota	112,000	(3)	15,000								2/1,165,500	2/ (3)	2/1,165,500	2/ (3)	1,165,500
Mississippi	10,000	(3)	25,000	10,000							2/ 147,000	2/ 10,000	2/ 147,000	2/ 10,000	2/ 2/157,000
Missouri	81,000	400,000	500	500					(3)		187,500	1,002,500	2/254,500	1,002,500	1,257,000
Montana					(3)						0	0	10,000	0	2/ 10,000
Nebraska	12,000										28,800	50,000	28,800	50,000	78,800
Nevada	2/ 1/	2/ 1/					2/ 1/				1/ 2/ 0	1/ 2/ 0	1/ 2/ 5/ 0	1/ 2/ 0	1/ 2/ 0
New England	45,000	15,000	(3)	(3)			180,400				5/ 813,000	5/ 515,000	1,493,400	5/ 515,000	5/ 2,008,400
New Jersey	40,000	5,000	10,000		40,000		30,000		40,000		265,000	20,000	505,000	20,000	525,000
New Mexico	5/	5/									1/ 2/ 0	1/ 2/ 5/ 0	1/ 2/ 0	1/ 2/ 5/ 0	1/ 2/ 0
New York	7,000	500,000	(3)	(3)	(3)	(3)	(3)	(3)			5/ 507,000	1,000,000	5/ 507,000	1,000,000	5/1,507,000
North Carolina											(3)	0	2/ 5,000	0	2/ 5,000
North Dakota											2/100,000	32,000	2/100,000	32,000	2/132,000
Ohio	(3)	(3)	50,000	(3)							50,000	(3)	50,000	(3)	50,000
Oklahoma	35,000	2,500			2,000				2/		2,178,800	124,500	2,246,800	2/124,500	2,371,300
Oregon							125,000	(3)	500,000	$10,000	0	0	2/ 825,000	10,000	2/835,000
Pennsylvania	(3)	(3)	(3)		(3)		(3)		(3)		(3)	(3)	(3)	(3)	(3)
South Carolina	2,000										92,050	2/ 5,000	92,050	2/ 5,000	2/ 97,050
South Dakota		(3)									75,000	20,000	75,000	20,000	95,000
Tennessee			10,000						500,000		2/ 55,700	2/ 7,500	2/ 555,700	2/ 7,500	2/ 563,200
Texas			1,500								2,333,500	73,750	2,346,000	73,750	2,419,750
Utah											2/ 0	0	2/ 0	0	2/ 0
Virginia					3,000	500					394,350	3,300	2/ 399,350	3,800	2/ 403,150
Washington	(3)						(3)		5 000		(3)	(3)	715,000	(3)	715,000
West Virginia											2/ 6,100	2/ 100	2/ 2/6,100	2/ 100	1/ 2/ 6,200
Wisconsin	25,000	5,000	300,000	(3)	25,000						1/2,840,000	1/ 2/555,000	1/2,865,000	1/ 2/555,000	2/3,420,000
Wyoming											0	(3)	8,000	(3)	2/ 8,000
Alaska					55,000				113,500		700	0	2/ 210,800	2/ 0	2/ 210,800
Hawaii									(3)		0	0	2/ 290,000	2/ 200,000	2/ 490,000
West Indies	50,000,000	6,000,000					200,000	50,000			50,000,000	6,000,000	2/50,200,000	2/6,050,000	56,250,000
Total	$ 1/ 2/ 5/ 51,178,075	$ 1/ 2/ 5/ 7,604,750	2/ $443,500	2/ $12,500	2/ $574,700	$ 2/ 5/ 1,617,000	$ 1/ 2/ 1,168,400	2/ $56,500	$ 1/ 2/ 1,275,400	$10,000	$ 1/ 2/ 4/ 5/ 65,737,425	$ 1/ 2/ 5/ 12,815,650	$ 1/ 2/ 4/ 5/ 71,587,475	$ 1/ 2/5/ 14,709,150	1/ 2/ 5/ $86,296,625

1 - Considerable damage from attendant heavy rains.
2 - Additional losses incurred; amount not reported.
3 - Losses incurred; amount not reported.
4 - Includes crop damage.
5 - Damage from attendant hail.

WINDSTORM LOSSES PAST YEARS

Table 17

(Windstorms other than tornadoes)

Year	Total loss of life	Total property loss
1916	65	$11,712,125
1917	25	1,400,550
1918	79	7,602,200
1919	344	28,170,760
1920	42	4,735,400
1921	65	13,174,650
1922	133	5,055,800
1923	68	5,261,800
1924	78	13,545,750
1925	88	11,612,380
1926	357	93,610,250
1927	64	6,783,160
1928	1,947	88,836,000
1929	46	20,334,600
1930	49	5,705,500
1931	17	7,773,000
1932	306	42,657,360
1933	156	65,604,100
1934	109	19,497,173
1935	461	17,191,000
1936	121	$17,256,265
1937	43	6,292,938
1938	630	315,435,388
1939	60	3,988,141
1940	251	25,588,925
1941	43	15,523,320
1942	68	32,691,640
1943	61	25,056,520
1944	448	207,745,900
1945	85	36,498,738
1946	70	29,515,178
1947	117	135,377,544
1948	52	59,169,862
1949	102	69,476,570
1950	210	134,798,806
1951	289	86,296,625
Total	7,149	1,670,975,918
Mean	199	46,415,998

NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES

YEAR 1951

A very remarkable feature of the 1951 hurricane season, and one which broke all records as far as is known, was the early beginning in May. There have been several May tropical storms since 1887, but none reached hurricane force. After this storm there were no others until August, which is the most likely month for the hurricane season to begin. The greatest number of tropical storms occur in September on an average, and a greater percentage of the storms reach hurricane intensity than in the other months. During the last 20 years, 54 percent of the storms reached hurricane intensity in August, 60 percent in September, and 52 percent in October. Over a 65-year period ending with the year 1951, however, the percentages for August, September, and October are 65, 58, and 43, respectively. In the early years the greater frequency of August storms, as recorded, was apparently due to the fact that a higher percentage of them were of sufficient violence to make history, and also to the greater likelihood of recurve into the Atlantic in September and October before reaching the United States or the West Indies, thus escaping detection in some earlier cases when communication and shipping were less developed.

The monthly and annual number of tropical storms and the number of storms reaching hurricane intensity, from 1932 to 1951, are shown for each year in Table 19. The total number of these storms for the 1887 to 1951 period are presented in Table 19a.

The May 1951 hurricane possessed other peculiarities in addition to its arrival early in the season. First, it was not tropical in any true sense of the word, since it formed near latitude 30° N. Second, it formed in modified maritime polar air. Third, it appeared first as an upper-level cold-core storm but became warm-core in the lower levels coincidental with the development of wind and rainfall distributions typical of tropical storms. Nevertheless, it possessed all the characteristics of a true hurricane. (See article on this storm by Paul L. Moore and Walter R. Davis in Monthly Weather Review for October 1951, entitled "A Pre-Season Hurricane of Sub-Tropical Origin").

For the United States this was the mildest hurricane season since 1930, in that only one storm reached the coast and there was no loss of life. However, there were only 2 tropical storms in 1930 as compared with 10 in 1951. When we consider the amount of damage though, it was the mildest season since 1939. Some of the coastal areas of Jamaica and Mexico did not fare so well. The hurricane of August 15 to 22 caused the greatest loss of life since the great Atlantic hurricane of 1944, the total in Jamaica being 152 and in Mexico 90. The amount of damage from this storm was estimated to be over $20,000,000.

All of the 10 storms detected during the season, except 2, reached hurricane intensity at some time during their course. The one storm that reached the United States coast crossed the Florida Peninsula on October 2, but it did not reach hurricane intensity until it had left the east coast and moved northeastward over the Atlantic. Two of the storms, the third and seventh of the season, reached the Mexican coast line and passed inland. The fourth storm caused damage and loss of life in islands of the Lesser Antilles. The small hurricane of October 12 to 16 developed in the northwestern Caribbean Sea and moved northward to within 60 to 80 miles of the Isle of Pines. The May storm passed close to the Bahamas and within 70 miles of Cape Hatteras. Three others of these storms followed nearly parallel courses northwestward and then northeastward well out in the Atlantic, and the last one of the season, October 15 to 20, formed and ran its course in an area about half way between the Georgia, South Carolina, and North Carolina coast and Bermuda.

The following are individual reviews of all North Atlantic hurricanes and tropical disturbances that occurred during the 1951 season. A synopsis of the important features of these storms is given in Table 18a; their tracks, named *alphabetically in chronological order, are shown by chart at the end of this bulletin.

*ABLE—May 16-24.—This was the first hurricane of the season, and, so far as is known, the earliest of record. It developed during the night of May 16, about 125 miles east of Daytona Beach, Fla. At 7:00 a.m. on the 17th, the S.S.R.P. Smith sent a special observation giving northwest wind of 50 to 60 m.p.h., falling pressure, and waves 25 to 30 feet high at latitude 28.5° N., longitude 79.5° W. During the 17th, Navy reconnaissance planes reported winds of 75 to 98 m.p.h. and central pressure, in an ill-defined eye, of about 29 inches. Movement was southwestward until the afternoon, when it began a curving path to the south and southeast. It was finally established that the center was moving on a broad curving loop. The Florida east coast from Daytona Beach to Miami came under the influence of squalls in connection with the edge of the storm during the afternoon of the 17th, and had winds of 30 to 40 m.p.h.

The southern bend of the loop brought the center very close to Grand Bahama and Little Abaco Islands in the Bahamas during the night of the 17th and the morning of the 18th. Both had winds of near hurricane force while the settlements on the Little Bahama Banks had winds of 90 to 95 m.p.h. for over 5 hours during the night of the 17th. After completing the loop, it moved on a north-northeastward course and passed about 70 miles east of Cape Hatteras around 3 to 5 a.m. of the 21st, but it was too far out to give damaging winds to the Cape.

During the afternoon and night of the 21st, the course turned more to eastward off the Virginia Capes and continued eastward or a little northeastward to about latitude 37.5° N., longitude 65.0° W. by the morning of the 23d, when it began to dissipate.

During much of the progress of this hurricane, wind speeds ranged from 80 to 100 m.p.h., and the area of hurricane winds was small. The eye averaged about 20 miles in diameter and was very well defined from the 18th on. The strongest winds reported in connection with the hurricane were estimated at 115 m.p.h. during the 21st, when the center was about 120 miles northeast of Cape Hatteras. Rainfall was not very heavy, and pilots reported that clouds did not build very high. Damage from this storm was light and no casualties were reported.

BAKER—August 2-5.—This tropical disturbance developed from an easterly wave on August 2, far to the northeast of the Leeward Islands at about latitude 23° N., longitude 56° W. It moved on a broad curving path northwestward and then northeastward and the winds increased to about 60 m.p.h. on the 3d. The center passed some 275 miles east of Bermuda on the 4th, and curved northeastward over the Atlantic.

CHARLIE—August 14-22.—This hurricane appeared east of the Lesser Antilles during the night of August 14-15, as a partially developed easterly wave. By the morning of the 15th, the winds had reached 104 m.p.h. Movement was between northwest and west-northwest until it passed through the island chain, and between west and northwest throughout the remainder of its course. The center passed between Roseau, Dominica, and Guadeloupe, but, oddly enough, the storm produced only gentle to moderate winds except at Desirade, east of Guadeloupe, where winds briefly reached 35 m.p.h. It is believed that the hurricane struck the mountainous northern portion of Dominica and quickly lost intensity, regenerating later as it passed south of Puerto Rico and Hispaniola.

Jamaica was battered for 5 hours by the intense fury and destructive force of the hurricane as it passed south of the island on the night of the 17th. Damage to property and crops totaled approximately $20,000,000. There were 152 persons killed, 2,000 injured, and about 25,000 were homeless. Strongest winds in Jamaica were estimated at 110 m.p.h. The lowest pressure was 28.74 inches, and the total rainfall 17 inches.

During the afternoon of the 18th, the center passed south of Grand Cayman Island and winds of 92 m.p.h. were recorded at the weather station at Georgetown. Just a few hours before the storm moved into the Yucatan Peninsula during the night of the 19th winds reached 130 m.p.h. The hurricane lost considerable force while crossing the Yucatan Peninsula but regained its former intensity rapidly after passing into the southwest Gulf of Mexico, and retained that strength until it passed inland a short distance north of Tampico around noon of the 22d. Tampico was apparently on the southern edge of the calm center. At 12:30 p.m., on August 22d, northwest winds of 100 m.p.h., with gusts to 110 m.p.h., were experienced, followed by a calm from 2:00 to 2:30 p.m. Then the wind shifted to southeast and increased rapidly until it reached 110 m.p.h. at 4:30 p.m. Lowest pressure was 28.81 inches at 1:30 p.m.

Damage to crops was extensive in the northern portion of the Yucatan Peninsula, loss being estimated at about 70 percent. Other areas in Mexico also suffered extensive damage to property and crops. In Tampico alone, damage to property amounted to $1,160,000. There was no loss of life in Yucatan, but a total of 90 deaths was reported from other areas, resulting mostly from bursting dams and flooding rivers.

DOG--September 2-5.--Reconnaissance planes located an area of disturbance several hundred miles east of Barbados on September 1. By the morning of the 2d, it was found to be a partially developed wave with squalls of hurricane force winds in its northeastern quadrant, a short distance east of Martinique, but winds on the southern side were weak. The hurricane passed through the Lesser Antilles on the 2d, and continued westward through the Caribbean Sea still as a partially developed wave.

Martinique suffered damage to property and crops amounting to $3,000,000. Five persons lost their lives at sea in the vicinity of the island. St. Lucia also suffered considerable damage. In the northern part of the island crop damage was estimated at $45,000 over an area of 80 square miles. Two persons lost their lives due to drowning when the northern coast line was inundated 100 feet inland due to high tides associated with the storm. One sailing vessel was destroyed and two others damaged. Winds of 115 m.p.h. were observed at the Fort-de-France Airport on St. Lucia. Lowest pressure reported was estimated at 29.29 inches on the 2d.

The hurricane, with its course vacillating between west and west-northwest, began to lose force on the afternoon of the 3d, at which time winds were 104 m.p.h. It continued to lose force and completely dissipated on the 5th some distance southeast of Swan Island.

EASY—September 3-12.—On the morning of the 3d, the S.S. Barn reported gale force winds and an indicated circulation, probably of hurricane force, near latitude 16.5° N., longitude 42.5° W. The storm moved on a west-northwest course until the 7th, when it began recurving northward. Winds at that time were estimated to be between 160 and 200 m.p.h. near the center and out to 100 miles from the center in the dangerous semicircle. On the 8th the hurricane curved sharply to a northeastward direction, passed southeast of Bermuda on the 9th, and continued northeastward over the Atlantic, well off Newfoundland, on the 12th. Lowest pressure reported was estimated at 28.26 inches on the 6th.

FOX--September 5-9.--A small hurricane center was discovered near latitude 16.5° N., longitude 37.5° W., on the morning of the 5th, when the S.S. Janecke Naess, in the vicinity, reported winds of 52 m.p.h. The storm moved on a northwesterly course at a rather fast rate of speed.

The New Zealand M.V. Ruahine ran into a violent squall at about latitude 22.8° N., longitude 55.7° W., at noon of the 7th, at which time the ship's barometer began to fall rapidly and a long, heavy swell came in from the northeast. By 5:30 p.m. winds had reached 100 to 150 m.p.h. in fierce squalls and the barometer fell 23 mbs. (0.68 inch) in 6 hours. The lowest barometer reading was 28.87 inches at 6 p.m. of the 7th. Apparently this was about the time the ship reached the hurricane center.

The hurricane passed about 350 miles east of Bermuda on the 8th. Thereafter it turned northeastward and continued its rapid movement over the Atlantic. It passed some distance east of Newfoundland on the 10th. Strongest winds reported in connection with this hurricane, except in squalls, were 115 to 120 m.p.h.

GEORGE--September 20-21.--This tropical storm formed in the southwest Gulf of Mexico on the 20th within an area where unsettled weather had prevailed for 2 days. The storm passed inland on the 21st south of Tampico, but the area of strong winds was small and the storm dissipated rapidly after reaching land. The strongest winds were about 60 m.p.h., as reported by aircraft in the afternoon of the 20th and morning of the 21st.

HOW--October 1-7.--This hurricane formed on the 1st from an easterly wave that had been tracked for several days over the western Caribbean Sea and into the central Gulf of Mexico. The first indication of a development was noted near latitude 26° N., and longitude 87.5° W. early on the 1st, when aircraft reported squalls with winds of about 40 m.p.h. and a closed wind circulation. The center turned sharply eastward and crossed Florida on the 2d, from near Ft. Myers to Vero Beach. Very heavy rains attended the central path of this storm over Florida, where amounts ranged from about 8 to 13 inches. No strong winds occurred near the center. The strong winds were in squalls along the lower Florida east coast and the Keys, reaching 50 to 60 m.p.h.

Minor damage resulted to small craft in the middle Gulf, and to buildings along the coast from Key West to West Palm Beach. The greatest damage in Florida was from rains that flooded farm and pasture lands over a broad belt extending from Naples, Ft. Myers, and Punta Gorda on the west Coast to Stuart, Ft. Pierce, and Vero Beach on the east. Early fall crops were flooded out in the rich Okeechobee farming area. Some cattle were lost by drowning and starvation. The amount of damage from all causes is estimated at about $2,000,000. No lives were lost and no injuries reported.

The storm increased to hurricane force as it moved northeastward over the Atlantic after leaving the Florida coast. The center passed about 70 miles east of Cape Hatteras on October 4, and around this time the strongest winds, about 110 m.p.h., occurred, but hurricane force winds were not experienced on the coast. The hurricane maintained considerable force until near the end of its course on the 7th.

The 3,325-ton cargo ship Southern Isle, bound for Chester, Pa., from San Juan, P.R., broke in two in high seas following passage of the hurricane and sank 200 miles southeast of Cape Hatteras, N. C., early on the 5th. Seventeen of the ship's 23 crew members lost their lives. Two ships were grounded near Cape Henry and one tugboat lost its tow.

ITEM—October 12-16.--This small hurricane developed in the northwestern Caribbean Sea near latitude 18° N., longitude 82° W., on the 12th, and moved slowly northward to a position 60 to 80 miles east-southeast of the Isle of Pines, where it dissipated on the 15th and 16th. The strongest winds reported were about 80 m.p.h., and lowest pressure about 29.45 inches. No damage was reported.

JIG--October 15-20.--Forming as a wave disturbance in the Atlantic near latitude 30° N., longitude 75° W., on the 15th, this hurricane was attended by winds up to 80 m.p.h. in squalls in a semicircular area north of the center. The center moved slowly northeastward at first, then described a loop to west and south in the area between Cape Hatteras and Bermuda on the 17th and 18th. The storm dissipated several hundred miles southwest of Bermuda on the 20th. No destructive winds occurred on land, and no reports of marine damage were received.

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* The reader will note that tropical storms in this publication have been identified alphabetically rather than numerically as was the case in previous years. The practice of naming tropical storms alphabetically in chronological order came about through action of the Air Coordinating Committee for Meteorology. It is an inter-service agreement between the Air Forces, Navy, and Weather Bureau.

HURRICANES AND TROPICAL DISTURBANCES

Table 18a . (Names of storms in table correspond to names of tracks on chart at end of publication) Year 1951

Storm name*	Date	Area where first reported	Coast lines crossed	Highest wind speed reported	Lowest pressure reported	Place of dissipation reported	Intensity	Remarks
ABLE	May 16-24	Near latitude 29.5° N., longitude 78.5° W., or about 125 miles east of Daytona Beach, Fla.	None	115 m.p.h.	29.00 in. on 17th.	Latitude 37.5°-40° N., longitude 60°-65° W.	Hurricane	Passed close to the Bahamas but damage was light and no casualties were reported.
BAKER	Aug. 2-5	Latitude 23° N., longitude 56° W.	None	60 m.p.h.	No data	Near latitude 40° N., longitude 57° W.	Not of hurricane intensity	Did not touch land.
CHARLIE	Aug.15-22	Latitude 13.5° N., longitude 59° W., east of the Lesser Antilles	Yucatan Peninsula and east coast of Mexico	130 m.p.h.	28.74 in. in Jamaica	North of Tampico, Mexico	Hurricane	Damage in Jamaica estimated at $20,000,000. There were 152 persons killed. Loss in crops in Yucatan estimated at 70 percent. Damage to property and crops in other sections of Mexico was considerable and 90 deaths were reported.
DOG	Sept.2-5	Latitude 14.3° N., longitude 61.1° W.	None	98 to 104 m.p.h. in squalls.	29.29 in. on 2d.	Latitude 16.7°N., longitude 81.3°W.	Hurricane	Damage in Martinique estimated at $3,000,000. Five persons lost their lives at sea in the vicinity of the island. In St. Lucia damage was over $45,000. Two persons were drowned.
EASY	Sept.3-11	Latitude 16.5° N., longitude 45° W.	None	Between 160 and 200 m.p.h.	28.26 in. on 6th.	Latitude 41.5° N., longitude 52° W.	Hurricane	Did not touch land.
FOX	Sept.5-9	Latitude 16.5° N., longitude 37.5° W.	None	115 to 120 m.p.h.	No data	Latitude 42° N., longitude 52° W.	Hurricane	Did not touch land.
GEORGE	Sept.20-21	Latitude 20° N., longitude 94° W.	Mexico	60 m.p.h.	No data	South of Tampico, Mexico	Not of hurricane intensity	No damage reported.
HOW	Oct. 1-7	Near latitude 21.3° N., longitude 84.6° W.	Florida	110 m.p.h.	29.44 in. on 2d.	Latitude 43.5°N., longitude 45°W.	Hurricane	Not of hurricane intensity when it crossed Florida. Damage from all causes estimated at about $2,000,000. Seventeen crew members of the cargo ship Southern Isle were drowned or died of injuries when the ship broke in two, 200 miles southeast of Cape Hatteras.
ITEM	Oct.12-16	Near latitude 18°N., longitude 82° W., northwestern Caribbean	None	80 m.p.h.	29.45 in.	Latitude 21° N., longitude 82° W.	Hurricane	Did not touch land.
JIG	Oct.15-20	Near latitude 30°N., longitude 75° W., about 400 miles east of the Georgia coast	None	80 m.p.h.	No data	Latitude 28.5°N., longitude 68°W.	Hurricane	Did not touch land.

* See footnote at end of hurricane article.

NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES FOR PAST YEARS

Table 19.- Frequency of tropical storms by month and season and number of storms reaching hurricane intensity, 1932-1951.

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1932									
Number of tropical storms	1	0	0	2	4	2	2	0	11
Number of hurricanes	0	0	0	2	2	0	2	0	6
1933									
Number of tropical storms	1	1	3	7	5	3	1	0	21
Number of hurricanes	0	1	1	3	3	2	0	0	10
1934									
Number of tropical storms	1	1	1	2	2	3	1	0	11
Number of hurricanes	0	1	0	1	1	1	1	0	5
1935									
Number of tropical storms	0	0	0	1	2	1	1	0	5
Number of hurricanes	0	0	0	1	2	1	1	0	5
1936									
Number of tropical storms	0	3	2	6	5	1	0	0	17
Number of hurricanes	0	1	1	1	2	0	0	0	5
1937									
Number of tropical storms	0	0	1	2	5	1	0	0	9
Number of hurricanes	0	0	0	0	2	0	0	0	2
1938									
Number of tropical storms	0	0	0	3	1	3	1	0	8
Number of hurricanes	0	0	0	3	1	0	0	0	4
1939									
Number of tropical storms	0	1	0	1	1	2	0	0	5
Number of hurricanes	0	0	0	0	0	2	0	0	2
1940									
Number of tropical storms	1	0	0	3	2	2	0	0	8
Number of hurricanes	0	0	0	3	1	0	0	0	4
1941									
Number of tropical storms	0	0	0	0	4	2	0	0	6
Number of hurricanes	0	0	0	0	3	1	0	0	4
1942									
Number of tropical storms	0	0	0	3	1	3	1	0	8
Number of hurricanes	0	0	0	1	0	0	1	0	2
1943									
Number of tropical storms	0	0	1	2	4	3	0	0	10
Number of hurricanes	0	0	1	1	2	1	0	0	5
1944									
Number of tropical storms	0	0	2	3	3	2	0	0	10
Number of hurricanes	0	0	0	2	2	1	0	0	5
1945									
Number of tropical storms	0	1	1	4	3	1	0	0	10
Number of hurricanes	0	1	0	1	1	1	0	0	4
1946									
Number of tropical storms	0	1	1	1	1	2	0	0	6
Number of hurricanes	0	0	0	0	1	1	0	0	2
1947									
Number of tropical storms	0	0	1	3	3	3	0	0	10
Number of hurricanes	0	0	0	1	1	2	0	0	4
1948									
Number of tropical storms	2	0	1	2	3	1	1	0	10
Number of hurricanes	0	0	0	1	3	1	0	0	5
1949									
Number of tropical storms	0	0	0	3	5	2	1	0	11
Number of hurricanes	0	0	0	3	4	2	1	0	10
1950									
Number of tropical storms	0	0	0	4	2	6	0	0	12
Number of hurricanes	0	0	0	4	2	5	0	0	11
1951									
Number of tropical storms	1	0	0	2	4	3	0	0	10
Number of hurricanes	1	0	0	1	3	3	0	0	8

Table 19a.- Total number of tropical storms by month and number reaching hurricane intensity for period 1887 to 1951

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1887 to 1951									
Number of tropical storms	8	27	34	112	160	131	29	2	503
Number of hurricanes	1	11	15	73	93	56	9	0	258

Table 19b.- Total number of tropical storms and loss of life and damage in United States, 1915-1941

Year	Total number of occurrences	Number reaching United States Coast	Loss of life in United States	Damage in United States
1915	5	2	550	$ 63,000,000
1916	13	3	107	33,324,000
1917	2	1	5	170,000
1918	4	1	34	5,000,000
1919	4	1	287	22,000,000
1920	4	2	2	3,000,000
1921	5	1	5	3,000,000
1922	5	0	0	0
1923	5	1	0	19,300
1924	8	1	2	Minor
1925	3	1	6	Minor
1926	10	3	269	106,500,000
1927	7	0	0	0
1928	6	3	1,836	25,000,000
1929	2	2	3	653,000
1930	2	1	0	Negligible
1931	8	3	0	0
1932	11	5	0	0
1933	21	5	63	45,650,000
1934	11	4	17	4,760,000
1935	5	2	414	11,500,000
1936	17	6	9	2,300,000
1937	9	5	0	42,500
1938	8	4	600	300,245,000
1939	5	3	3	2,000
1940	8	2	51	4,743,550
1941	6	4	10	7,675,000
Total	194	66	4,273	$ 638,584,350
Mean	7.2	2.4	158.2	23,651,272

Table 19c.- Total number, loss of life, and damage in all areas, and in the United States, 1942 to 1951†

Year	Total number		Loss of Life		Damage	
	In all areas	Reaching U.S. Coast	Total all areas	In United States	Total all areas	In United States
1942	8	3	17	8	$ 31,101,000	$ 27,101,000
1943	10	4	19	16	16,765,000	16,765,000
1944	10	4	1,076	64	202,010,000*	165,010,000
1945	10	5	29	7	80,133,000*	80,133,000
1946	6	4	5	0	5,200,000*	5,200,000
1947	10	8	72	53	135,757,500	135,757,500
1948	10	5	24	3	24,400,000*	18,400,000
1949	11	3	4	4	59,762,000	58,750,000
1950	12	4	27	19	36,925,000*	35,850,000
1951	10	1	244	0	25,045,000*	2,000,000
Total	97	41	1,517	174	$617,098,500	$544,966,500
Mean	9.7	4.1	151.7	17.4	$ 61,709,850	$ 54,496,650

* Considerable additional damage for which figures are not available.

† Loss of life and damage not available outside of United States prior to 1942.

GENERAL SUMMARY OF FLOOD LOSSES FOR 1950

Monetary losses from floods in the United States estimated at $176,000,000 were nearly twice as large as in 1949, but considerably smaller than in 1947 or 1948. It averaged approximately 65 percent of the flood losses sustained in 1947 and 77 percent of that sustained in 1948. In comparison with 1946, the monetary losses in 1950 were approximately 2.5 times greater. In comparison with the National Average of $112,600,000 (period 1924-1950), the flood losses during the year of 1950 were more than 1.5 times greater. The total loss in life in 1950 was 93 in comparison to 48 in 1949. It was slightly higher than the National Average of 83 lives of the last 27 years. The amount of savings for the entire country resulting from the flood forecasting and warning service totaled approximately $27,000,000.

There were two outstanding floods during 1950. The first occurred during the spring of the year in the Red River of the North Basin and the other in the late fall in the Central Valleys of California and western Nevada. The flood in the Red River of the North Basin was generally the highest since 1897 at Grand Forks, N. Dak., and since 1826 at the international boundary. Two separate severe floods occurred in the Central Valleys of California and western Nevada, the first in the latter half of November and the second during the first part of December. These floods were record breaking and unusual for so early in the season. These two floods accounted for approximately 40 percent of the total flood damages. A summary of the flooding during the year 1950 was published in issue No. 13 of Volume 1 of this publication.

*Flood loss statistics for 1948 were published in the August 1950 issue of Climatological Data, National Summary, for 1949 in Volume 1, No. 13 (annual) of this same publication. Annual flood losses and savings for previous years have been published in the Monthly Weather Review.

*ANNUAL FLOOD LOSSES AND SAVINGS FOR PREVIOUS YEARS HAVE BEEN PUBLISHED

IN THE MONTHLY WEATHER REVIEW AS FOLLOWS:

Year	Issue of Review	Pages	Year	Issue of Review	Pages
1933	Vol. 62, No. 1, Jan. 1934	25-27	1940	Vol. 69, No. 7, July 1941	217-218
1934	Vol. 62, No. 12, Dec. 1934	465-467	1941	Vol. 71, No. 11, Nov. 1943	185-186
1935	Vol. 63, No. 12, Dec. 1935	362-365	1942 & 1943	Vol. 73, No. 8, Aug. 1945	137-139
1936	Vol. 65, No. 1, Jan. 1937	28-31	1944 & 1945	Vol. 76, No. 6, June 1948	113-116
1937	Vol. 66, No. 12, Dec. 1938	426-430	1946	Vol. 76, No. 9, Sept. 1948	208-210
1938	Vol. 68, No. 9, Sept. 1940	262-263	1947	Vol. 77, No. 9, Sept. 1949	262-265
1939	Vol. 68, No. 11, Nov. 1940	329-330			

Table F 1

ESTIMATED FLOOD LOSSES FOR 1950

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's, bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
HUDSON BAY DRAINAGE																
Red River of North........	$ A5,054,000	....	....	....	....	$ B14,449,500	....	....	....	....	$13,135,600	....	$350,000	....	$32,989,100	9
Total........	5,054,000	....	....	....	....	14,449,500	....	....	....	....	13,135,600	....	350,000	....	32,989,100	9
ST. LAWRENCE DRAINAGE Lake Michigan																
#Grand River........	31,900	$3,500	$1,400	$3,200	$6,500	....	....	....	$500	$2,500	$7,500	....	14,000	....	71,000	.....
Total........	31,900	3,500	1,400	3,200	6,500	....	....	....	500	2,500	7,500	....	14,000	....	71,000	.....
Lake Erie																
Maumee River and tributaries........	63,000	10,000	5,000	28,000	64,000	103,500	....	....	41,000	....	136,000	....	31,000	....	481,500	.....
Total........	63,000	10,000	5,000	28,000	64,000	103,500	....	....	41,000	....	136,000	....	31,000	....	481,500	.....
ATLANTIC SLOPE DRAINAGE																
Androscoggin River........	....	....	....	....	....	....	....	....	....	....	....	....	....	$20,000	20,000	.....
Merrimack and Pemigewasset Rivers........	....	....	....	....	....	....	....	....	....	....	8,000	....	....	....	8,000	.....
Israel River........	3,000	....	4,000	2,000	2,500	....	....	....	....	....	....	....	8,500	....	20,000	.....
Hoosic River........	13,000	....	1,000	....	....	....	....	....	....	....	5,000	$5,000	16,000	25,000	65,000	.....
East Branch of Delaware River........	100,000	15,000	....	60,000	60,000	....	....	....	....	....	200,000	....	5,000	....	440,000	.....
Lehigh River........	....	....	....	30,000	....	....	....	....	....	....	....	....	25,000	....	55,000	.....
Perkiomen Creek........	25,000	5,000	13,500	5,000	1,000	....	....	....	....	....	....	2,000	5,000	....	56,500	1
Schuylkill River........	....	....	1,000	1,000	....	....	....	....	....	....	....	10,000	....	....	12,000	.....
Susquehanna River and tributaries........	235,100	400,300	520,100	1,503,000	105,500	2,000	$100,000	....	50,700	25,000	255,000	100,000	276,100	2,900,000	6,472,800	1
Potomac River........	....	....	....	....	300	....	....	....	....	....	....	....	....	....	300	.....
Rapidan River........	....	200	....	....	....	....	....	....	....	....	....	....	....	....	200	.....
James River........	340,000	....	155,000	25,000	15,000	....	....	....	337,000	....	311,000	20,000	....	....	1,203,000	.....
Total........	716,100	420,500	694,600	1,626,000	184,300	2,000	100,000	....	387,700	25,000	779,000	137,000	335,600	2,945,000	8,352,800	2
EAST GULF OF MEXICO DRAINAGE																
Oostanaula River........	....	....	....	....	....	....	....	....	....	....	....	....	....	57,000	57,000	.....
Coosa River........	....	....	....	....	....	....	....	....	....	....	....	....	100	154,000	154,100	.....
Tombigbee and Black Warrior Rivers........	....	....	....	....	....	....	....	$12,000	6,000	....	2,500	....	20,000	25,000	65,500	.....
*Chickasawhay River........	....	....	....	....	....	....	....	....	....	....	....	....	....	30,000	30,000	.....
*Leaf River........	....	....	....	....	....	....	....	....	....	....	....	....	....	75,000	75,000	.....
*Bogue Chitto River........	....	....	....	....	....	....	....	....	....	....	....	....	....	15,000	15,000	.....
#Pearl River........	38,000	25,000	40,000	10,000	25,000	....	25,000	15,000	10,000	25,000	25,000	10,000	90,000	700,000	1,038,000	.....
Total........	38,000	25,000	40,000	10,000	25,000	....	25,000	27,000	16,000	25,000	27,500	10,000	110,100	1,056,000	1,434,600	.....
MISSISSIPPI SYSTEM Upper Mississippi Basin																
Zumbro and Whitewater Rivers........	7,000	....	15,000	5,500	3,000	18,000	....	....	3,000	100	19,500	....	2,000	....	73,100	.....
Root River........	A189,000	....	....	....	....	B232,200	....	....	3,000	2,000	157,600	....	7,000	1,000	591,800	.....
Upper Iowa River........	....	....	....	....	....	52,000	....	1,000	5,000	2,000	....	....	....	....	60,000	.....
Kickapoo River........	2,000	....	3,200	800	2,500	100,000	....	200	....	....	4,000	....	10,500	....	123,200	.....
Turkey River........	500	20,000	700	....	17,800	500,000	....	51,000	C30,000	....	68,000	....	....	....	688,000	.....
Grant, Platte and Galena Rivers........	200	....	1,000	500	501,000	20,000	....	....	....	....	525,000	1,000	200	....	1,048,900	1

See reference notes at end of table.

Table F 1--Continued

ESTIMATED FLOOD LOSSES FOR 1950

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's, bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI SYSTEM--CONT. Upper Mississippi Basin--Cont.																
Wapsipinicon River	....	....	....	....	....	$10,000	$2,000	$3,000	$12,000	$10,000	$95,000	....	....	....	$132,000	.....
Rock and Pecatonica Rivers	$26,800	....	$409,700	$65,900	$167,200	1,000,000	....	....	C117,600	....	593,800	$6,300	$76,000	....	2,463,300	1
Cedar River	2,000	....	....	....	....	....	....	....	....	....	....	....	....	....	2,000	.....
Henderson River (Illinois)	....	....	....	....	....	541,000	....	....	....	133,800	....	....	....	....	674,800	.....
Skunk River	5,000	....	....	....	....	27,000	....	....	3,000	6,200	....	....	....	....	41,200	.....
Fabius River	....	....	....	....	....	83,500	....	....	....	....	....	....	....	....	83,500	.....
Mississippi River (Upper)	121,000	$12,000	33,000	29,000	1,300,500	80,000	13,000	33,000	1,110,000	40,000	1,230,000	31,500	45,000	1,000,000	5,078,000	.....
Total	353,500	32,000	462,600	101,700	1,992,000	2,663,700	15,000	88,200	1,283,600	194,100	2,692,900	38,800	140,700	1,001,000	11,059,800	2
Missouri Basin																
#Minor tributaries of Missouri River (Montana)	50,000	10,000	500	....	23,900	18,700	....	20,000	70,600	....	241,400	11,000	2,800	....	448,900	1
Cannonball River	186,000	220,000	63,500	15,000	240,000	....	166,000	53,000	340,000	54,000	1,440,000	122,500	93,000	....	2,993,000	.....
*Grand River and tributaries	14,200	....	5,900	....	1,300	52,800	....	....	372,000	....	680,200	1,600	109,400	....	1,237,400	.....
*Moreau River and tributaries	....	....	....	....	....	1,500	....	....	8,200	....	114,800	....	12,700	....	137,200	.....
#James River	165,000	70,000	190,000	75,000	150,000	420,000	125,000	40,000	70,000	30,000	225,000	120,000	160,000	....	1,840,000	.....
#Floyd River	....	....	....	....	....	66,500	1,500	....	500	....	17,500	....	....	....	86,000	.....
*Boyer, Soldier, Maple, Little Sioux Rivers and Wolf Creek	37,900	....	....	....	....	474,500	....	....	....	....	132,200	....	....	....	644,600	.....
*Papillion Creek (Nebraska)	....	....	....	....	....	39,000	....	....	....	....	4,800	....	....	....	43,800	.....
*Plum Creek (Nebraska)	....	....	....	....	....	256,100	....	....	....	....	48,700	....	....	....	304,800	.....
#Elkhorn River and tributaries	39,500	37,900	7,500	4,000	8,800	33,000	3,000	500	4,600	....	6,600	....	2,900	....	148,300	.....
*Platte River and tributaries (Nebraska)	1,767,200	....	4,700	....	6,000	934,600	....	....	8,600	....	850,300	....	....	6,100	3,577,500	.....
*Nodaway River	....	....	....	....	....	40,800	....	....	300	....	4,500	....	....	....	45,600	.....
*Nemaha River and tributaries	A350,600	....	....	....	....	2,709,500	....	78,600	C336,800	....	3,415,000	31,100	145,300	....	7,066,900	12
*Saline River and tributaries	A34,600	....	....	....	....	168,300	....	....	C17,300	....	31,900	....	....	....	252,100	.....
*Solomon River and tributaries	A68,500	....	....	....	....	290,800	....	300	C10,300	....	198,800	....	1,000	....	569,700	.....
*Smoky Hill River and tributaries	160,700	....	....	....	....	115,900	....	....	1,200	....	42,700	1,200	4,000	....	325,700	.....
*Republican River and tributaries	A236,700	....	....	....	....	846,200	....	16,800	C66,800	....	300,500	6,300	4,500	....	1,477,800	.....
*Big Blue River and tributaries	A693,800	....	....	....	....	1,188,500	....	21,300	C86,200	....	1,177,700	54,800	22,500	....	3,244,800	5
*Delaware River	....	....	....	....	....	67,500	....	....	700	....	1,600	....	....	....	69,800	.....
*Wakarusa River	....	....	....	....	....	28,800	....	....	300	....	....	....	....	....	29,100	.....
*Stranger Creek	....	....	....	....	....	63,000	....	....	700	....	2,500	....	....	....	66,200	.....
*Kansas River and tributaries	A12,900	....	....	....	....	126,700	....	....	6,700	....	68,300	....	....	....	214,600	.....
*Thompson River and tributaries	....	....	....	....	....	339,800	....	....	4,500	....	11,500	....	....	....	355,800	.....
*Grand River and tributaries	....	....	....	....	....	979,400	....	....	6,600	....	96,200	....	....	....	1,082,200	.....
*Chariton River and tributaries	A1,400	....	....	....	....	947,800	....	....	16,000	....	21,100	....	....	....	986,300	.....
*Blackwater and Lamine Rivers	....	....	....	....	....	31,900	....	....	1,500	....	600	....	....	....	34,000	.....
*Marais des Cygnes River	A9,600	....	....	....	....	286,100	....	....	C10,300	....	12,200	....	....	....	318,200	.....
*Osage River tributaries	....	....	....	....	....	173,200	....	....	C13,200	....	7,300	....	....	....	193,700	.....
*Gasconade River and tributaries	....	....	....	....	....	115,400	....	....	6,700	....	3,900	....	....	....	126,000	.....
#Missouri River and minor tributaries	271,400	49,900	133,800	38,300	137,600	3,302,800	54,800	34,600	84,400	16,400	2,261,500	80,500	153,800	550,000	7,189,800	.....
Total	4,100,000	387,800	405,900	132,300	567,600	14,119,100	350,300	265,100	1,545,000	100,400	11,419,300	429,000	711,900	556,100	35,089,800	18

See reference notes at end of table.

Table F 1--Continued

ESTIMATED FLOOD LOSSES FOR 1950

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's. bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI SYSTEM--CONT. Ohio Basin																
#Allegheny River	$254,000	$106,500	$94,800	$135,200	$80,300	$6,100	...	$3,000	$6,500	$3,000	...	...	$132,000	...	$599,800	1
#Buckhannon River	...	...	...	...	10,000	...	...	...	...	...	...	...	...	...	10,000	...
#Tygart River	300	...	100	...	60,000	...	...	...	...	...	...	...	...	...	60,400	...
Monongahela and West Fork Rivers	25,000	930,000	405,000	595,000	265,000	880,000	$30,000	500	170,000	50,000	$133,000	$843,000	230,000	...	4,556,500	...
Muskingum River and tributaries	...	...	...	...	...	...	...	...	...	...	...	...	...	$1,785,000	1,785,000	1
#Little Kanawha River	A1,091,000	...	...	...	...	690,000	...	...	174,000	...	1,500,000	245,000	320,000	41,000	4,061,000	31
Hocking River	...	...	...	...	...	...	...	...	...	...	...	...	...	108,000	108,000	...
New River	1,200	200	...	...	...	1,000	...	...	...	...	...	...	300	...	2,700	...
Elk River (West Virginia)	2,000	...	500	...	500	500	...	...	...	...	2,000	...	1,100	...	6,600	1
Little Sandy River	13,000	5,000	30,000	...	20,000	967,000	75,000	2,700	187,000	21,500	76,000	6,000	8,500	...	1,411,700	3
Tygarts Creek (Kentucky)	20,000	3,000	5,000	...	100,000	30,000	...	...	15,000	3,000	...	...	...	...	176,000	...
#Scioto River	...	...	...	...	...	385,000	...	...	...	...	...	...	32,000	74,500	491,500	...
Little Miami River	...	...	...	...	2,000	...	...	...	...	60,000	...	...	...	...	62,000	...
Wabash and White Rivers	179,900	14,400	8,000	45,600	272,000	657,800	8,300	9,000	28,000	7,500	1,202,000	2,200	221,000	...	2,655,700	1
#Cumberland River	550,000	100,000	175,000	87,900	50,000	14,500	30,500	500	191,100	11,000	38,800	5,000	60,200	...	1,314,500	2
French Broad River and tributaries	...	1,500	300	800	800	44,000	...	...	...	...	10,700	...	...	18,900	77,000	2
Tennessee River and tributaries	900	...	300	1,300	2,100	...	...	...	...	...	23,000	...	2,000	...	29,600	1
#Ohio River and tributaries	279,200	64,000	342,400	47,200	322,100	701,000	172,200	41,200	310,800	51,000	401,300	42,500	2,080,700	2,710,000	7,565,600	7
Total	2,416,500	1,224,600	1,061,400	913,000	1,177,000	4,376,900	316,000	56,900	1,082,400	207,000	3,386,800	1,143,700	3,087,800	4,737,400	25,195,200	50
White Basin																
Black River	...	...	...	...	...	573,100	...	...	3,800	...	5,200	...	70,600	...	652,700	...
Little Red River	100	700	1,500	2,500	...	...	...	...	1,000	100	700	...	400	...	7,000	...
#White River	47,400	...	...	...	...	1,909,800	...	4,600	18,100	...	262,700	...	125,100	...	2,367,700	...
Total	47,500	700	1,500	2,500	...	2,482,900	...	4,600	22,900	100	268,600	...	196,100	...	3,027,400	...
Arkansas Basin																
Purgatoire River	2,200	...	...	...	9,500	...	...	...	...	...	5,000	...	2,500	...	19,200	...
Walnut Creek	5,000	5,000	17,500	20,000	17,500	180,000	18,000	800	24,000	8,500	15,000	17,500	25,000	26,000	379,800	...
Cow Creek	100,000	10,000	30,000	50,000	30,000	192,000	...	...	...	...	15,000	...	10,000	...	437,000	...
Cimarron River	3,900	14,000	300	...	32,000	2,300	...	...	300	...	173,000	15,000	300	...	241,100	...
Caney River	18,000	500	10,000	4,000	10,000	510,000	...	4,000	1,000	6,000	17,000	6,000	21,000	...	607,500	...
Verdigris River	...	...	5,000	5,000	20,000	7,000	...	...	...	...	77,000	...	6,300	...	120,300	...
Neosho River	1,000	500	...	600	...	57,200	...	...	3,000	2,000	29,000	...	...	...	93,300	...
Canadian River and tributaries	500	...	70,000	...	18,000	385,500	...	900	48,000	23,400	158,800	10,000	600	...	715,700	...
Petit Jean River	...	...	...	...	...	73,000	...	...	...	...	...	...	700	...	73,700	...
Fourche La Fave River	...	...	...	...	...	29,200	...	...	...	...	...	...	200	...	29,400	...
Arkansas River	5,000	5,000	17,500	25,000	17,500	2,189,200	...	1,000	10,500	...	35,600	17,500	225,800	...	2,549,600	...
Total	135,600	35,000	150,300	104,600	154,500	3,625,400	18,000	6,700	86,800	39,900	525,400	66,000	292,400	26,000	5,266,600	...

See reference notes at end of table.

Table F 1--Continued

ESTIMATED FLOOD LOSSES FOR 1950

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's. bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI SYSTEM--CONT. Red Basin																
Ouachita River	...	...	...	...	...	$14,500	...	...	...	...	$5,000	...	$50,000	...	$69,500	...
#Little River	$300	...	$2,200	...	$200	80,000	...	$13,000	$9,900	$2,000	18,600	$10,300	400	...	136,900	...
#Sulphur River	...	...	...	...	10,000	643,500	...	...	25,000	...	5,000	...	43,000	$42,000	768,500	...
#Cypress River	300	...	...	...	...	800	...	...	...	...	...	...	...	500	1,600	1
#Red River	6,000	$2,000	...	...	...	107,100	...	...	...	...	12,000	...	1,400	...	128,500	...
Total	6,600	2,000	2,200	...	10,200	845,900	...	13,000	34,900	2,000	40,600	10,300	94,800	42,500	1,105,000	1
Lower Mississippi Basin																
#St. Francis River	6,000	10,000	8,000	$5,000	20,000	5,000	$5,000	1,000	80,000	5,000	50,000	5,000	300,000	...	500,000	...
Yazoo, Tallahatchie and Coldwater Rivers	...	...	...	...	...	...	...	...	...	...	...	...	...	6,500,000	6,500,000	...
#Mississippi River (Lower) including Atchafalaya River	33,800	20,000	25,000	15,000	78,000	332,000	17,000	81,000	416,400	11,500	393,800	4,000	1,643,700	...	3,071,200	6
Total	39,800	30,000	33,000	20,000	98,000	337,000	22,000	82,000	496,400	16,500	443,800	9,000	1,943,700	6,500,000	10,071,200	6
WEST GULF OF MEXICO DRAINAGE																
Sabine River	...	...	25,000	...	...	...	...	...	...	...	75,000	...	...	...	100,000	...
Trinity River	...	...	...	...	...	20,000	...	2,500	1,000	200	1,000	...	45,300	...	70,000	...
Embudo Arroyo (Albuquerque, N. Mex.)	135,700	4,000	23,000	10,000	7,000	...	...	...	...	...	...	8,500	33,500	...	221,700	...
Arroyos in Vicinity of Hot Springs, N. Mex.	15,000	5,000	...	...	5,000	...	...	...	...	...	...	...	...	...	25,000	...
Total	150,700	9,000	48,000	10,000	12,000	20,000	...	2,500	1,000	200	76,000	8,500	78,800	...	416,700	...
GULF OF CALIFORNIA DRAINAGE Great Basin																
Weber River	...	...	11,800	1,600	...	58,000	...	...	...	...	28,900	...	2,700	23,600	126,600	...
Truckee, Carson and Walker Rivers	...	...	...	...	...	...	...	...	...	...	...	...	...	4,000,000	4,000,000	...
Total	...	...	11,800	1,600	...	58,000	...	...	...	...	28,900	...	2,700	4,023,600	4,126,600	...
PACIFIC SLOPE DRAINAGE Tulare Basin																
•Kings River	D20,000	...	183,000	...	...	B2,314,000	...	...	...	...	...	1,430,000	...	...	3,947,000	...
•Kaweah River and tributaries	D89,000	...	E148,000	...	155,700	B370,000	...	...	...	...	377,300	731,300	...	...	1,871,300	...
•Tule River	D61,000	...	E249,000	...	...	B544,000	...	...	...	...	...	350,000	...	...	1,204,000	...
Kern River	21,000	5,000	170,200	8,900	85,000	863,700	...	7,600	85,700	...	395,000	220,000	135,500	...	1,997,600	...
•Tulare Lake	...	...	...	...	...	B676,000	...	...	...	...	...	134,000	...	...	810,000	...
•Deer Creek	...	...	...	...	...	B5,000	...	...	...	...	...	44,000	...	...	49,000	...
Total	191,000	5,000	750,200	8,900	240,700	4,772,700	...	7,600	85,700	...	772,300	2,909,300	135,500	...	9,878,900	...
San Joaquin Basin																
Mokelumne, Consumnes Rivers and Dry Creek	D33,000	...	E154,000	...	...	...	...	1,036,900	...	...	...	695,000	...	...	1,918,900	...
Calaveras River, Bear and Littlejohn Creeks	D49,000	...	E10,000	...	...	...	...	B305,000	...	...	F106,000	...	...	...	470,000	...
Stanislaus River	D10,000	...	E48,000	...	...	...	...	B883,000	...	...	F196,000	...	...	...	1,137,000	...

See reference notes at end of table.

Table F 1--Continued

ESTIMATED FLOOD LOSSES FOR 1950

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's. bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
PACIFIC SLOPE DRAINAGE--CONTD. San Joaquin Basin--Contd.																
Tuolumne River	D$224,000	....	E$76,000	....	....	....	....	$ B296,000	....	....	....	$54,000	....	....	$650,000	....
*Merced River	D24,000	....	E13,000	....	$30,000	B$372,000	....	....	....	....	F$1,996,000	....	....	....	2,435,000	....
*Merced County Streams Group	D5,000	....	E41,000	....	....	B140,000	....	....	....	....	F210,000	....	....	....	396,000	....
*Chowchilla River	D15,000	....	E34,000	....	41,000	B158,000	....	....	....	....	F109,000	....	....	....	357,000	....
*Fresno River	....	....	....	....	....	B123,000	....	....	....	....	F90,000	....	....	....	213,000	....
*San Joaquin River	....	....	....	....	....	B211,000	....	....	....	....	F33,000	....	....	....	244,000	....
Total	360,000	....	376,000	....	71,000	1,004,000	....	2,520,900	....	....	2,740,000	749,000	....	....	7,820,900	....
Sacramento Basin																
Yuba River	D1,188,500	....	E905,500	....	....	400,000	....	506,000	....	....	954,600	29,700	$450,000	....	4,434,300	....
Bear River	....	....	....	....	....	100,000	....	129,800	....	....	300	144,400	3,000	....	377,500	....
American River	D1,421,200	....	E387,400	....	....	25,000	....	512,200	....	....	1,074,700	....	269,800	....	3,690,300	....
*Feather River	....	....	....	....	....	B76,000	....	....	....	....	197,000	....	....	....	273,000	....
Sacramento River	30,000	D$847,500	E30,900	....	....	4,500	....	B15,600	....	....	F1,011,100	....	78,500	....	2,018,100	....
Total	2,639,700	847,500	1,323,800	....	....	605,500	....	1,163,600	....	....	3,237,700	174,100	801,300	....	10,793,200	....
Coastal Drainage																
Russian River	300	3,000	....	....	....	....	....	527,000	....	....	....	....	....	$105,000	635,300	....
Eel River	....	....	....	....	....	....	....	....	....	....	20,000	....	....	10,000	30,000	....
Scott and Shasta Rivers	....	....	....	....	10,500	....	....	....	....	....	....	....	....	....	10,500	....
Smith River	....	....	....	....	....	10,000	$4,000	13,000	$80,000	$10,000	400,000	50,000	17,000	....	584,000	....
Chetco, Winchuck, Pistol and Lower Rogue Rivers	....	....	....	....	35,000	25,000	....	5,000	30,000	17,000	....	1,000	2,204,000	....	2,317,000	....
Rogue River	....	....	....	....	175,000	500	....	....	....	....	....	....	....	....	175,500	1
Coquille and Coos Rivers	1,600	....	....	$5,000	13,000	1,000	....	3,000	5,000	....	20,000	....	10,500	....	59,100	3
Umpqua River	20,000	100,000	500,000	100,000	500,000	5,000	5,000	1,000	10,000	3,000	100,000	10,000	120,000	....	1,474,000	....
Total	21,900	103,000	500,000	105,000	733,500	41,500	9,000	549,000	125,000	30,000	540,000	61,000	2,351,500	115,000	5,285,400	4
Columbia Basin																
#Kootenai River	15,000	....	....	....	....	1,159,100	....	....	10,000	....	347,000	....	250,000	....	1,781,100	1
#Flathead River	5,000	....	....	....	....	5,000	....	....	....	....	15,000	....	....	....	25,000	....
#Pend Oreille River	....	....	....	....	....	117,000	....	....	5,000	....	....	....	....	....	122,000	....
Snake, Willamette and Columbia Rivers	3,000	12,000	300,000	79,600	2,100	465,000	....	60,600	20,800	9,200	109,400	8,500	540,100	....	1,610,300	....
Umatilla River and tributaries	....	....	....	....	....	....	....	....	....	....	45,000	....	....	....	45,000	....
Total	23,000	12,000	300,000	79,600	2,100	1,746,100	....	60,600	35,800	9,200	516,400	8,500	790,100	....	3,583,400	1
Grand Total	16,388,800	3,147,600	6,167,700	3,146,400	5,346,200	51,253,700	855,300	4,847,700	5,244,700	651,900	40,774,300	5,754,200	11,468,000	21,002,600	176,049,100	93

* Figures furnished by Corps of Engineers, U. S. Army.

A Includes all urban losses.

B Includes all rural losses.

C Includes movable equipment.

D Includes all residential losses.

E Includes all commercial losses.

F Includes public utilities.

# Coordinated with Corps of Engineers, U. S. Army.

GENERAL SUMMARY OF FLOOD LOSSES FOR 1951

Monetary losses from floods in the United States estimated at $1,028,742,000 were nearly 2.5 times larger than the previous record flood loss of $440,740,000 of 1937. Based on the 1951 price index the 1937 figure would amount to $780,000,000 which is still nearly $250,000,000 lower than the record flood loss of 1951. In comparison with 1950, the monetary losses in 1951 were nearly 6 times greater. In comparison with the national average (unadjusted) of $145,320,000 (period 1924-1951) the flood losses during the year 1951 were more than 6 times greater. The total loss in life in 1951 was 51 in comparison to 142 in 1937, and 93 in 1950. It was considerably lower than the national average of 82 lives of the last 28 years. The reported savings for the entire country resulting from the flood forecasting and warning service totaled approximately $35,500,000.

The most outstanding floods during 1951 occurred in the Kansas-Missouri and adjoining areas during June and July. They were considered the most devastating floods in the nation's history as to monetary losses and accounted for $935,224,000 of the $1,028,742,000 national flood loss, or 90%. Tremendous damage occurred in the industrial and agricultural areas and in business and residential districts of many cities. A loss of 25 lives may be attributed directly to these floods. Record-breaking river stages were experienced on the Kansas, Osage, and Neosho Rivers; in the Neosho River the crest at Parsons, Kans., was 9 feet higher than previous records; in the Kansas River stages were generally the highest since the great flood of 1844.

Table F 2

ESTIMATED FLOOD LOSSES FOR 1951

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's, bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
HUDSON BAY DRAINAGE																
Red River of North	$8,600	$5,200	....	....	$1,500	....	....	....	....	....	....	....	$500	....	$15,800	....
Total	8,600	5,200	....	....	1,500	....	....	....	....	....	....	....	500	....	15,800	....
ST. LAWRENCE DRAINAGE Lake Superior																
Bad and White Rivers	8,000	....	....	....	....	....	....	....	....	....	....	....	....	....	8,000	....
Lake Michigan																
Grand River	10,000	15,000	$39,000	$2,000	1,000	....	....	....	....	....	....	....	....	....	67,000	....
Lake Erie																
Maumee River and tributaries	5,000	2,000	....	2,000	8,500	$10,000	$500	....	$500	$500	$9,000	....	2,000	....	40,000	....
Total	23,000	17,000	39,000	4,000	9,500	10,000	500	....	500	500	9,000	....	2,000	....	115,000	....
ATLANTIC SLOPE DRAINAGE																
Merrimack River and tributaries	....	....	25,000	....	30,000	....	....	....	....	....	....	....	50,000	....	105,000	....
Connecticut River	....	....	....	....	....	....	....	....	....	....	....	....	....	$2,000	2,000	....
Esopus and Schoharie Creeks (N.Y.)	126,700	....	123,200	....	5,000	....	....	....	....	....	3,000	....	....	....	A/257,900	1
Delaware River and tributaries	16,000	7,500	21,000	12,000	25,500	....	....	....	4,500	1,600	45,000	$3,500	20,500	....	157,100	....
Susquehanna River and tributaries	25,500	....	....	....	....	....	....	....	....	....	160,000	500	150,000	B/58,300	A/394,300	....
Pee Dee River	....	....	....	....	....	....	....	....	....	....	1,500	....	7,500	....	9,000	....
Total	168,200	7,500	169,200	12,000	60,500	....	....	....	4,500	1,600	209,500	4,000	228,000	60,300	925,300	1
EAST GULF OF MEXICO DRAINAGE																
Alabama River and tributaries	....	....	....	....	....	....	....	....	....	....	....	....	....	2,073,600	B/2,073,600	....
Black Warrior and Tombigbee Rivers	63,700	19,300	50,000	39,400	130,500	209,000	12,200	$25,300	46,800	20,300	21,900	19,800	589,000	....	A/1,247,200	....
Chickasawhay River and tributaries	10,000	2,000	5,000	20,000	60,000	10,000	....	10,000	....	....	10,000	....	....	....	A/127,000	....
Pearl River	8,500	8,000	....	....	384,000	50,000	....	29,100	45,800	....	209,000	....	127,600	....	A/862,000	....
Total	82,200	29,300	55,000	59,400	574,500	269,000	12,200	64,400	92,600	20,300	240,900	19,800	716,600	2,073,600	4,309,800	....
MISSISSIPPI SYSTEM Upper Mississippi Basin																
St. Croix River	....	....	....	....	....	....	....	....	....	....	....	....	....	15,000	15,000	....
Cannon River Valley (Minn.)	10,000	....	....	....	40,000	75,000	10,000	....	15,000	....	15,000	....	5,000	....	170,000	....
Chippewa River and tributaries	200	....	....	6,000	....	....	....	....	....	....	73,000	....	2,000	....	81,200	....
Zumbro and Whitewater Rivers	940,000	25,000	15,000	20,000	510,000	65,000	2,500	....	....	15,000	22,500	12,000	30,000	....	1,657,000	....
Trempealeau and La Crosse Rivers	6,000	....	....	....	40,000	5,000	....	....	10,000	....	7,500	5,000	....	....	73,500	....
Black River	....	....	....	....	....	10,000	....	....	....	....	50,000	....	....	....	60,000	....
Root River and tributaries	80,000	20,000	15,000	12,000	20,000	205,000	15,000	5,000	115,000	5,000	101,200	8,000	20,000	....	621,200	....
Bad Axe River and Coon Creek	5,000	3,000	3,000	1,500	10,000	10,000	3,000	1,000	2,000	4,000	5,000	....	....	....	47,500	....
Upper Iowa River	20,000	....	10,500	....	55,000	20,500	5,000	....	1,500	....	19,200	....	2,500	....	134,200	....
Pine River	13,000	16,000	12,000	55,000	100,000	820,000	10,000	25,000	50,000	8,000	10,000	5,000	6,000	....	1,130,000	....
Kickapoo River and tributaries	187,000	136,500	163,800	216,500	288,000	1,347,500	95,000	23,000	290,300	10,000	698,500	30,000	75,000	....	3,561,100	6
Wisconsin River	1,500	1,000	....	....	500	....	....	....	5,000	....	15,000	....	2,200	....	25,200	....
Turkey River (Iowa)	2,300	....	....	....	....	200,000	....	....	88,100	1,000	....	....	....	....	291,400	....

See reference notes at end of table.

Table F 2--Continued

ESTIMATED FLOOD LOSSES FOR 1951

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's, bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI SYSTEM--CONT. Upper Mississippi Basin--Cont.																
Maquoketa River (Iowa)	$11,200	....	$18,100	....	....	$343,300	....	....	$47,100	....	$3,500	....	$7,500	....	A/$430,700	....
Plum and Apple Rivers	....	....	....	....	....	129,200	....	....	4,500	....	....	....	....	....	A/133,700	....
Wapsipinicon River	6,900	$900	14,500	$5,800	$3,700	45,800	....	$500	391,200	$1,300	16,000	....	3,600	....	490,200	....
Rock River and tributaries	106,400	....	....	....	17,000	1,951,300	....	107,500	108,800	....	8,000	....	16,500	....	2,315,500	....
Edwards River	....	....	....	....	....	48,300	....	....	21,700	....	....	....	....	....	70,000	....
Cedar and Iowa Rivers	....	....	....	....	....	5,000	....	....	....	....	678,100	....	2,000	....	685,100	....
Skunk River	....	....	....	....	30,000	111,100	$66,500	2,000	200,000	40,000	2,000	$3,000	815,000	....	1,269,600	....
Raccoon River	....	....	....	....	....	....	....	....	....	....	38,500	....	....	....	38,500	....
Des Moines River	....	....	....	....	....	....	....	....	....	....	20,000	....	....	....	20,000	....
Illinois River	C/534,000	....	....	....	....	D/855,000	....	....	....	....	....	....	3,000	....	B/1,392,000	....
Salt River (Missouri)	....	....	....	....	800	900	....	....	....	....	1,000	500	1,800	....	5,000	....
Bourbeuse River	....	....	....	....	....	84,000	1,000	....	....	1,000	....	....	20,000	....	106,000	....
Meremec River	C/221,000	....	....	....	....	D/283,000	....	....	....	....	....	....	....	....	B/504,000	....
Kaskaskia River	C/100,000	....	....	....	....	D/5,894,000	....	....	....	....	....	....	....	....	B/5,994,000	....
Mississippi River and tributaries	*7,086,300	1,008,100	1,373,300	975,400	944,000	# 25,138,200	317,500	124,000	1,781,100	102,000	4,011,000	447,000	†7,169,200	....	A/50,477,100	....
Total	9,330,800	1,210,500	1,625,200	1,292,200	2,059,000	37,647,100	525,500	288,000	3,131,300	187,300	5,795,000	510,500	8,181,300	$15,000	71,798,700	6
Missouri Basin																
Beaverhead River	....	....	....	....	....	....	....	D/26,500	....	....	3,500	....	....	....	B/30,000	....
Milk River	4,200	....	22,600	....	800	....	....	....	....	....	....	....	....	....	B/27,600	....
Yellowstone River and minor tributaries	207,200	....	104,000	....	73,700	....	....	D/80,300	....	....	78,400	1,300	8,200	2,500	B/555,600	....
Knife River	20,000	10,000	15,000	....	10,000	....	....	2,000	10,000	3,000	10,000	....	5,000	....	85,000	....
Heart River	10,000	5,000	5,000	....	6,000	....	....	....	5,000	....	1,000	1,000	2,000	....	35,000	....
Cottonwood Creek	....	....	....	....	18,000	....	....	....	....	....	38,500	....	....	....	B/56,500	....
James River	....	....	....	....	....	171,000	....	....	....	....	....	....	....	....	B/171,000	....
Vermillion River	C/24,200	....	....	....	....	D/113,000	....	....	....	....	13,700	....	....	....	B/150,900	....
Big Sioux River	C/830,600	....	....	....	....	D/1,144,500	....	....	....	....	253,000	....	....	....	2,228,100	1
Perry Creek (in Sioux City)	500	....	....	....	....	2,000	....	....	....	....	....	....	....	....	2,500	....
Floyd River	9,000	....	5,000	800	5,500	77,000	22,500	....	11,500	....	16,500	200	3,000	....	151,000	....
Little Sioux River and tributaries	C/145,000	....	....	....	....	D/1,950,000	....	....	....	....	1,300,000	....	....	....	B/3,395,000	....
Soldier Creek and tributaries	....	....	....	....	....	D/70,000	....	....	....	....	11,000	....	....	....	B/81,000	....
Papillion Creek (Nebraska)	2,300	....	55,000	....	....	33,400	....	....	....	....	9,500	....	....	....	A/100,200	....
South Platte River and tributaries	93,000	....	59,300	....	328,500	12,600	....	515,500	2,200	....	680,700	4,800	4,300	438,300	B/2,139,200	7
Victoria and Lillian Creeks	....	....	....	....	....	D/2,600	....	....	....	....	2,400	....	....	....	B/5,000	....
Elkhorn River and tributaries	50,500	20,000	7,500	....	46,800	62,000	9,500	....	28,000	10,000	29,300	....	14,000	....	A/277,800	1
Salt Creek and tributaries	749,300	....	....	....	2,300	851,400	....	....	....	....	114,800	....	....	....	1,717,800	....
Saline River and tributaries	C/417,000	....	....	....	....	D/ 6,323,000	....	....	....	....	....	....	1,099,000	....	B/7,839,000	1
Solomon River and tributaries	C/ 1,485,000	....	....	....	....	D/ 13,852,000	....	....	....	....	....	....	1,140,000	....	B/16,477,000	....
Smoky Hill River and tributaries	C/ 6,243,000	....	....	....	....	D/ 12,269,000	....	....	....	....	....	....	2,438,000	....	B/20,950,000	5
Republican River and tributaries	C/7,000	....	....	....	....	D/9,898,000	....	....	....	....	....	....	522,000	....	B/ 210,427,000	2

See reference notes at end of table.

Table F 2--Continued

ESTIMATED FLOOD LOSSES FOR 1951

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's, bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI SYSTEM--CONT. Missouri Basin--Cont.																
Little Blue	....	....	....	....	....	$811,000	$10,000	$15,000	$5,000	$80,000	$5,000	....	....	....	$926,000	1
Big Blue	C/ $674,000	....	....	....	....	D/ 14,465,000	....	....	....	....	....	....	$2,251,000	....	B/17,390,000	4
Kansas and minor tributaries	C/ 279,113,000	....	....	....	....	D/ 55,378,000	....	....	....	....	....	....	317,492,000	....	B/ 651,983,000	....
Osage River and tributaries	C/5,316,000	....	....	....	....	D/ 20,961,000	....	....	....	....	....	....	6,485,000	....	B/32,762,000	4
Gasconade River	....	....	....	....	$5,000	1,566,500	1,000	....	25,000	2,000	1,000	....	500	....	1,601,000	....
Missouri River and minor tributaries	1/1,976,500	....	$500	....	2,000	2/ 98,179,400	388,800	1,000	1,073,200	484,800	123,700	$63,000	3/ 16,015,500	....	A/ 118,308,400	5
Total	297,377,300	$35,000	273,900	$800	498,600	238,192,400	431,800	640,300	1,159,900	579,800	2,692,000	70,300	347,479,500	$440,800	889,872,400	31
Ohio Basin																
West Fork and Monongahela Rivers	33,000	79,200	111,800	382,800	10,100	800	....	....	....	....	51,400	....	425,600	18,000	1,112,700	1
Little Kanawha River	23,000	....	....	....	....	13,000	....	....	....	....	....	....	....	....	36,000	....
Hocking River	C/ 353,000	....	....	....	....	D/ 110,000	....	....	....	....	4,000	....	....	....	B/ 467,000	....
Green Brier River (West Va.)	4,000	10,000	10,000	91,000	20,000	....	....	....	....	....	....	....	....	....	B/ 135,000	....
Scioto River	....	....	....	....	....	83,500	....	500	1,300	....	....	....	....	....	85,300	....
Kentucky River	500	200	300	500	....	....	....	....	....	....	116,600	700	3,000	....	121,800	....
Wabash and White Rivers	....	....	....	....	500	1,550,000	....	....	....	....	200,000	1,800	2,000	....	1,754,300	....
Cumberland River	400,000	17,500	15,000	32,000	25,000	7,000	....	5,600	60,000	25,000	26,800	17,500	19,700	....	A/ 651,100	....
Jonothan Creek (North Carolina)	....	....	....	....	....	400	....	....	5,900	....	7,500	....	....	....	13,800	....
West Fork and Little Pigeon Rivers	400	....	45,400	....	168,600	....	....	....	....	....	30,400	....	9,800	....	254,600	....
First Creek (Tennessee)	700	....	400	600	100	....	....	....	....	....	800	....	400	....	3,000	....
Little River	6,300	....	2,400	....	....	....	....	....	....	....	28,200	300	5,800	....	43,000	....
Tellico and Little Tennessee Rivers and Sweet Water Creek	200	....	2,500	....	....	....	....	....	....	5,700	....	....	1,300	....	9,700	....
Hiwassee River and tributaries	500	....	5,300	....	....	....	800	....	1,500	....	22,000	200	3,000	....	33,300	....
Elk River	300	....	1,200	2,800	....	....	....	....	....	....	....	100	2,700	....	7,100	....
Duck River	3,200	....	2,500	5,700	....	....	....	....	....	....	200	200	5,300	....	17,100	....
Ohio River and minor tributaries	....	....	....	....	....	42,100	....	....	1,500	....	13,800	500	86,600	....	144,500	....
Total	825,100	106,900	196,800	515,400	224,300	1,806,800	800	6,100	70,200	30,700	501,700	21,300	565,200	18,000	4,889,300	1
White Basin																
Black River	....	....	....	....	....	25,000	1,000	1,000	11,000	6,000	30,000	....	23,000	....	A/ 97,000	....
White River	....	....	....	....	....	158,000	....	....	16,000	....	28,000	....	27,000	....	A/ 229,000	....
Total	....	....	....	....	....	183,000	1,000	1,000	27,000	6,000	58,000	....	50,000	....	326,000	....
Arkansas Basin																
Little Arkansas River	510,300	....	....	....	33,100	135,400	....	....	169,700	....	21,000	4,900	191,700	....	1,066,100	....
Ninnescah River	....	....	....	....	....	....	....	....	....	....	....	....	5,000	....	5,000	....
Chickaskia-Salt Rivers	C/ 305,000	....	....	....	....	D/2,910,200	....	....	....	....	....	....	10,000	....	B/ 3,225,200	....
Cimarron River	....	....	....	....	17,000	19,600	....	....	....	6,500	....	....	....	....	43,100	....
Verdigris River and minor tributaries	C/ 804,700	....	....	....	....	D/2,937,400	....	....	....	....	....	....	140,000	....	B/ 3,882,100	4
Neosho-Cottonwood Rivers	C/ 12,289,700	....	....	....	....	D/17,389,300	....	....	....	....	....	....	584,100	....	B/30,263,100	3
North Canadian	500	....	....	....	240,700	80,000	....	3,000	34,000	6,300	475,000	5,000	7,500	....	852,000	....

See reference notes at end of table.

Table F 2--Continued

ESTIMATED FLOOD LOSSES FOR 1951

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's, bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
MISSISSIPPI SYSTEM--CONT. Arkansas Basin--Cont.																
South Canadian........	$........	....	....	....	$174,000	$27,500	....	....	$21,700	....	$51,000	$1,000	$2,400	....	$277,600	....
Arkansas River and minor tributaries...	**1,140,000	$5,000	$95,500	....	55,500	Φ2,205,100	....	$32,700	45,200	$15,000	288,500	5,000	‡ 503,400	....	A/4,390,900	3
Total........	15,050,200	5,000	95,500	....	520,300	25,704,500	....	35,700	270,600	27,800	835,500	15,900	1,444,100	....	44,005,100	10
Red Basin																
Deroche Creek........	12,300	....	....	....	....	....	....	....	....	....	....	....	....	....	12,300	....
Ouachita River........	....	....	....	....	....	....	....	300	300	....	1,000	....	500	....	2,100	....
Little River........	....	....	....	....	....	1,700	....	....	1,200	7,600	5,000	1,600	600	....	17,700	....
Sulphur River........	....	....	....	....	....	1,362,000	....	500	....	....	....	....	....	....	1,362,500	....
Red River........	136,900	44,200	25,300	....	50,000	290,400	....	20,000	30,000	10,000	50,000	50,000	....	....	B/706,800	....
Total........	149,200	44,200	25,300	....	50,000	1,654,100	....	20,800	31,500	17,600	56,000	51,600	1,100	....	2,101,400	....
Lower Mississippi Basin																
St. Francis River........	....	....	....	....	....	5,000	$2,000	500	14,000	500	12,500	....	38,000	....	A/72,500	....
Tallahatchie, Yazoo and Coldwater Rivers........	....	....	....	....	....	5,600,000	....	....	....	....	....	....	....	....	5,600,000	....
Mississippi River	25,000	5,000	10,000	....	5,000	5,000	2,000	....	40,000	5,000	60,000	8,000	158,000	....	323,000	....
Total........	25,000	5,000	10,000	....	5,000	5,610,000	4,000	500	54,000	5,500	72,500	8,000	196,000	....	5,995,500	....
WEST GULF OF MEXICO DRAINAGE																
Sabine River........	....	....	....	....	....	5,000	....	....	....	....	....	....	....	....	A/5,000	....
San Antonio River and tributaries........	90,000	14,200	6,300	....	....	....	....	....	....	....	1,500	....	....	....	A/112,000	....
Guadalupe River........	....	....	....	....	....	5,400	....	2,700	2,100	....	....	....	....	....	A/10,200	....
Rio Grande River........	66,300	....	4,100	....	....	3,100	....	....	....	....	1,600	....	36,200	....	A/111,300	....
Total........	156,300	14,200	10,400	....	....	13,500	....	2,700	2,100	....	3,100	....	36,200	....	238,500	....
GULF OF CALIFORNIA DRAINAGE Colorado Basin																
Eagle River........	....	....	....	....	....	....	....	....	....	....	500	....	....	....	500	....
Gila River........	6,100	10,000	5,000	$5,000	382,500	132,500	5,000	2,500	12,200	10,200	193,000	14,200	8,000	....	A/786,200	....
Salton Sea Drainage........	14,100	....	9,500	....	500	D/15,400	....	....	....	....	59,000	4,000	....	....	B/102,500	....
Total........	20,200	10,000	14,500	5,000	383,000	147,900	5,000	2,500	12,200	10,200	252,500	18,200	8,000	....	889,200	....
PACIFIC SLOPE DRAINAGE Sacramento Basin																
Eel River........	....	....	....	....	....	20,000	....	....	....	....	80,000	....	....	....	100,000	....
Upper Sacramento River and Yolo Bypass.	100	....	1,000	....	....	75,000	....	4,200	800	200	10,000	....	100	....	91,400	....
Russian River........	....	....	....	....	....	....	....	....	....	....	....	....	....	$169,000	B/169,000	....
Total........	100	....	1,000	....	....	95,000	....	4,200	800	200	90,000	....	100	169,000	360,400	....
Columbia Basin																
Kootenai Valley........	5,000	....	5,000	....	....	35,000	....	....	5,000	....	12,000	....	30,000	....	A/92,000	....
Coeur D'Alene........	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Portneuf River........	....	....	....	....	7,000	60,000	....	....	....	....	....	....	....	....	67,000	....
Rogue River........	....	....	....	....	....	....	....	....	....	....	51,800	....	....	....	51,800	....
Total........	5,000	....	5,000	....	7,000	95,000	....	....	5,000	....	63,800	....	30,000	....	210,800	2

See reference notes at end of table.

Table F 2--Continued

ESTIMATED FLOOD LOSSES FOR 1951

River and drainage	Urban Property					Rural Property					Other Property		Miscellaneous	Unclassified	Total Loss	Lives Lost
	Residential		Commercial		Public	Crops		Livestock	Other		RR's, bridges, Highways, etc.	Public Utilities				
	Fixed	Movable	Fixed	Movable		Growing	Stored		Fixed	Movable						
PACIFIC SLOPE DRAINAGE--CONT. Puget Sound Basin																
Chehalis River	$	$	$	$	$	$	$	$	$	$	$	$	$	$44,000	$44,000	....
Green River	....	....	....	....	....	....	....	....	....	....	....	....	....	268,300	268,300	....
Snoqualmie River	....	....	....	....	....	....	....	....	....	....	....	....	....	231,500	231,500	....
Stillaguamish River	....	....	....	....	....	....	....	....	....	....	....	....	....	315,500	315,500	....
Snohomish River	....	....	....	....	....	....	....	....	....	....	....	....	....	451,200	451,200	....
Skagit River	....	....	....	....	....	....	....	....	....	....	....	....	....	928,200	928,200	....
Nooksack River	....	....	....	....	....	....	....	....	....	....	....	....	....	449,600	449,600	....
Total	....	....	....	....	....	....	....	....	....	....	....	....	....	2,688,300	2,688,300	....
Grand Total	323,221,200	1,489,800	2,520,800	1,888,800	4,393,200	311,428,300	980,800	1,066,200	4,862,200	887,500	10,879,500	719,600	358,938,600	5,465,000	1,028,741,500	51

A/ Coordinated with U.S. Engineers.
B/ By U.S. Engineers.
C/ Includes all urban property.
D/ Includes all rural property.

* $4,431,000 of this amount includes all urban property by U.S. Engineers.
** $1,072,900 of this amount includes all urban property by U.S. Engineers.
† $691,000 of this amount by U.S. Engineers.
‡ $489,900 of this amount by U.S. Engineers.
# $11,291,000 of this amount includes all rural property by U.S. Engineers.
⊕ $1,745,100 of this amount includes all rural property by U.S. Engineers.

1/ $1,971,000 of this amount includes all urban property by U.S. Engineers.
2/ $94,444,000 of this amount includes all rural property by U.S. Engineers.
3/ $16,000,000 of this amount by U.S. Engineers.

GENERAL SUMMARY OF RIVER AND FLOOD CONDITIONS

YEAR 1951

The most outstanding flood during 1951 occurred in the Kansas-Missouri area during July. It was considered one of the most devastating floods in the Nation's history. Tremendous damage occurred in the industrial and agricultural areas and in business and residential districts of many cities. A loss of 25 lives may be attributed directly to the flood. Record-breaking river stages were experienced on the Kansas, Osage and Neosho Rivers; in the Neosho River the crest at Parsons, Kans., was 9 feet higher than previous records; in the Kansas River stages were generally the highest since the great flood of 1844.

The most important flooding during January was in the Ohio Basin and along the Pacific Coast where the Eel River reached its highest crest since 1943 at Fernbridge, Calif. It was the fourth consecutive month with light to moderate flooding in many streams in the Columbia Basin in northwest Oregon and southwest Washington. Flooding elsewhere was mostly minor.

Severe floods occurred in streams in western Washington during February. Considerable damages resulted from the overflows in the lower reaches of the Nooksack, Snohomish, Skagit, Green and Stillaquamish Basins, but in most streams they were not as great as in December 1933. Near-record flooding occurred in some of the tributary streams in the Ohio Basin. The Kentucky River reached a near-record stage at Hazard, Ky., and the Little Kanawha a near-record stage at Glenville, W. Va. Extensive damage occurred along the Kentucky River but there was very little damage along the Little Kanawha. A record-low February stage was reached on the Missouri River at Kansas City, Mo., on the first day of the month.

Severe and record-breaking floods occurred in several streams in the East Gulf of Mexico drainage during the latter part of March. The overflows along the Warrior and Tombigbee Rivers were the worst since 1900. Record-breaking floods occurred along the Coosa River in Alabama and the Oostanaula River in Georgia. near-record floods occurred along the Cahaba River in Alabama. The ice-breakup began in the Missouri River on March 26 and progressed rapidly upstream from Decatur, Nebr., to Pierre, S. Dak., by the end of March. Flooding along the main stem was minor in comparison to recent years.

The most damaging flood on record occurred in the Upper Mississippi Basin during the month of April. The floods were especially severe along the Minnesota River and along the main stem of the Mississippi River from St. Paul, Minn., southward to Burlington, Iowa. Only minor flooding occurred along most of the tributaries below St. Paul southward to Burlington. The Minnesota River reached a stage of 26.2 feet at Mankato, Minn., which is the highest authentic Weather Bureau gage reading ever recorded. Levels in the Mississippi River between Hastings, Minn., and Gordons Ferry, Iowa, were the highest since the maximum of record in June 1880. Record to near-record floods occurred in the East Gulf of Mexico drainage during the latter part of March and the first part of April. The floods in the Warrior and Tombigbee Rivers were the highest since 1900.

Moderate to heavy flooding was reported during May on the Arkansas, Saline and Solomon Rivers in Kansas. A disastrous flash flood occurred in the Missouri Basin on Big Creek at Hays, Kans. Six deaths resulted with property damage estimated at near 2 million dollars.

Several severe flash floods were reported in the Ohio Basin during June. Westmoreland County in the Jeannette-Greensburg, Pa., area suffered its greatest damage in history with losses estimated at one million dollars. Potential conditions were created during June for one of the most devastating floods in the Nation's history in the Kansas-Missouri area. The rainfall for June in the State of Kansas averaged over 240 percent of normal. Critical flooding occurred in this area during June but it was minor compared to the floods in July. Several streams in the lower Missouri Basin reached record to near-record stages in June.

The Kansas-Missouri flood of July 1951 was one of the most devastating floods in the history of our country. The monetary damages have been estimated at nearly a billion dollars and the loss in life placed at 25. This flood was the greatest to strike this important agricultural and industrial area in more than a century and constituted a major national catastrophe. Thirty thousand farms, consisting of 3 million acres, were stripped of fences, equipment and buildings. Industrial districts and transportation centers of three metropolitan areas, Kansas City, Kans., Kansas City and St. Louis, Mo., and two State Capitols, Topeka, Kans., and Jefferson City, Mo., were in the path. In addition, 150 flourishing communities and smaller cities experienced severe damage.

Flooding during August was insignificant in comparison with the flooding of the previous month. Floods again visited the Kansas-Missouri area which was so severely hit in July. The floods were mostly light except in the McCracken and Brownell, Kans., areas along the Big Timber Creek, where the crest was the highest remembered by long-time residents.

Floods again visited the area in September which only two months ago experienced one of the most disastrous floods of record. The Saline River in Kansas approached within 0.9 foot of the record July stage of 30.2 feet. Severe floods were also reported along the Marais des Cygnes in Kansas, and along the Floyd River in Iowa. It was the third severe flood of the year along the latter stream. Light to moderate flooding was reported along several other streams in the Missouri Basin. It was the first time in 76 years of record that the Missouri River at Kansas City, Mo., had reached bankfull level in September.

No significant flooding was reported in the United States during October. The only flooding reported was scattered light overflows in the Mississippi and Columbia Basins. Record to near-record low stages were reached in some streams in the Atlantic Slope drainage.

Flooding during November and December was mostly minor. One of the worst ice jams in 20 years was reported on the Allegheny River about 8 miles above Oil City, Pa., during December. Damages, however, were minor.

RADIOSONDE DATA

Average annual values

Table 20

YEAR 1951

Standard pressure surface (mb.)	ALBUQUERQUE, N. MEX. (837 MB.)				ATLANTA, GA. (983 MB.)				BIG SPRING, TEX. (925 MB.)				BISMARCK, N. DAK. (956 MB.)				BOISE, IDAHO (914 MB.)				BROWNSVILLE, TEX. (1014 MB.)				BUFFALO, N. Y. (991 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	1,620	14.9	35	12	307	15.7	70	12	784	17.9	43	12	505	2.4	77	12	868	11.1	56	12	6	21.8	82	12	221	7.9	77
1,000--	12	78			12	157			12	103			12	134			12	109			12	127	21.9	78	12	140		
950----	12	530			12	599	16.3	63	12	550			12	556	2.2	70	12	549			12	578	19.8	73	12	570	8.1	66
900----	12	1,000			12	1,054	14.3	61	12	1,016	18.7	39	12	993	3.7	61	12	999	12.6	45	12	1,038	18.5	66	12	1,011	5.8	66
850----	12	1,487			12	1,535	11.7	60	12	1,505	16.5	38	12	1,456	2.0	59	12	1,476	10.0	42	12	1,527	16.8	52	12	1,477	3.6	63
800----	12	2,001	13.9		12	2,040	9.3	56	12	2,018	13.6	38	12	1,944	.0	57	12	1,977	6.5	44	12	2,042	14.6	47	12	1,968	1.4	59
750----	12	2,546	10.0		12	2,581	6.7	51	12	2,563	10.1	40	12	2,466	- 2.5	55	12	2,508	2.8	47	12	2,593	12.1		12	2,490	- 1.0	54
700----	12	3,110	5.7		12	3,137	3.9	48	12	3,129	6.4	39	12	3,003	- 5.5	52	12	3,058	- .9	48	12	3,160	8.9		12	3,034	- 3.4	50
650----	12	3,714	1.1		12	3,742	.5	44	12	3,737	2.5		12	3,589	- 8.7	49	12	3,649	- 4.7	47	12	3,775	5.1		12	3,622	- 6.4	47
600----	12	4,349	- 3.7	41	12	4,374	- 3.2		12	4,374	- 1.8		12	4,197	-12.4	46	12	4,270	- 8.8	45	12	4,419	1.0		12	4,239	- 9.7	44
550----	12	5,032	- 8.7	43	12	5,063	- 7.3		12	5,064	- 6.4		12	4,863	-16.5	42	12	4,943	-13.0		12	5,116	- 3.5		12	4,909	-13.6	
500----	12	5,761	-13.8		12	5,794	-11.8		12	5,800	-11.3		12	5,566	-21.3	41	12	5,660	-17.8		12	5,859	- 8.3		12	5,625	-17.9	
450----	12	6,560	-19.2		12	6,601	-17.1		12	6,605	-16.7		12	6,342	-26.7		12	6,443	-23.3		12	6,677	-13.7		12	6,407	-23.2	
400----	12	7,420	-25.3		12	7,466	-23.2		12	7,476	-23.1		12	7,175	-32.8		12	7,292	-29.3		12	7,556	-19.9		12	7,257	-29.2	
350----	12	8,375	-32.3		12	8,430	-30.2		12	8,439	-30.2		12	8,102	-39.6		12	8,232	-36.4		12	8,531	-27.1		12	8,201	-35.8	
300----	12	9,444	-40.2		12	9,508	-38.2		12	9,518	-38.3		12	9,140	-46.8		12	9,284	-44.1		12	9,623	-35.5		12	9,255	-43.1	
250----	12	10,666	-48.9		12	10,736	-47.5		12	10,746	-47.4		12	10,331	-53.0		12	10,486	-51.7		12	10,866	-45.1		12	10,460	-50.4	
200----	12	12,105	-56.5		12	12,176	-56.4		12	12,193	-56.3		12	11,757	-55.3		12	11,917	-56.4		12	12,321	-55.5		12	11,893	-55.1	
175----	12	12,945	-59.1		12	13,017	-59.6		12	13,030	-59.9		12	12,606	-55.0		12	12,762	-56.6		12	13,161	-60.6		12	12,737	-55.5	
150----	12	13,905	-61.7		12	13,970	-62.5		12	13,985	-63.3		12	13,588	-55.2		12	13,739	-57.0		12	14,109	-65.5		12	13,709	-56.2	
125----	12	15,027	-64.7		12	15,084	-65.4		12	15,092	-67.0		12	14,750	-56.1		12	14,889	-58.0		12	15,206	-69.7					
100----	12	16,380	-67.2		12	16,433	-67.1		12	16,430	-69.4		12	16,162	-56.8		12	16,299	-58.7		12	16,523	-72.5					
80-----	12	17,728	-65.4		12	17,783	-66.1		12	17,761	-67.8		12	17,580	-56.9		12	17,700	-58.7		12	17,837	-70.9					
60-----	12	19,496	-62.0		12	19,537	-62.7						12	19,416	-56.9		12	19,515	-57.4		12	19,559	-64.9					
50-----	12	20,630	-59.8																		12	20,681	-60.6					

Standard pressure surface (mb.)	BURRWOOD, LA. (1017 MB.)				CAMAGUEY, CUBA (1002 MB.)				CARIBOU, ME. (992 MB.)				CHARLESTON, S. C. (1017 MB.)				CIUDAD VICTORIA, MEX. (974 MB.)				COLUMBIA, MO. (988 MB.)				DODGE CITY, KANS. (924 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	3	20.4	86	12	122	21.7	92	12	191	3.1	79	12	13	16.1	84	12	335	26.0		12	239	11.0	73	12	792	10.7	66
1,000--	12	151	20.9	78	12	144	21.9	99	12	127			12	157	18.4	72	12	100			12	133			12	118		
950----	12	598	18.5	71	12	598	21.4	79	12	548	4.0	68	12	602	16.9	63	12	556	24.4		12	567	11.3	64	12	555		
900----	12	1,056	16.3	66	12	1,059	19.1	77	12	983	2.1	67	12	1,058	14.5	61	12	1,024	20.8		12	1,014	9.5	62	12	1,009	12.4	55
850----	12	1,541	14.1	56	12	1,549	16.5	69	12	1,443	.2	66	12	1,539	12.0	58	12	1,516	17.5		12	1,487	7.7	58	12	1,488	11.2	51
800----	12	2,051	11.9	49	12	2,064	13.9	66	12	1,928	- 1.8	63	12	2,045	9.4	54	12	2,032	14.8		12	1,986	5.9	52	12	1,992	9.1	48
750----	12	2,595	9.4	44	12	2,609	11.2		12	2,447	- 3.8	58	12	2,586	6.9	48	12	2,584	12.2		12	2,518	3.6	49	12	2,529	6.5	45
700----	12	3,159	6.6		12	3,180	8.1		12	2,982	- 6.2	54	12	3,143	4.1	43	12	3,153	9.2		12	3,070	.7	47	12	3,088	3.1	43
650----	12	3,769	3.3		12	3,794	4.9		12	3,565	- 9.0	51	12	3,748	.7		12	3,770	5.5		12	3,667	- 2.7	45	12	3,687	- .8	42
600----	12	4,409	- .5		12	4,438	1.2		12	4,175	-12.2	47	12	4,381	- 2.9		12	4,414	1.5		12	4,291	- 6.4		12	4,319	- 5.0	41
550----	12	5,102	- 4.8		12	5,136	- 2.9		12	4,841	-16.1	44	12	5,069	- 6.9		12	5,113	- 2.8		12	4,970	-10.6	41	12	4,998	- 9.6	
500----	12	5,842	- 9.6		12	5,883	- 7.4		12	5,547	-20.5	41	12	5,803	-11.5		12	5,859	- 7.5		12	5,693	-15.2		12	5,726	-14.6	
450----	12	6,655	-15.1		12	6,702	-12.6		12	6,323	-25.7		12	6,610	-16.9		12	6,679	-12.7		12	6,486	-20.7		12	6,519	-19.9	
400----	12	7,528	-21.3		12	7,586	-18.7		12	7,163	-31.6		12	7,478	-23.0		12	7,562	-18.8		12	7,342	-26.9		12	7,380	-26.1	
350----	12	8,498	-28.5		12	8,567	-25.8		12	8,095	-38.0		12	8,442	-30.1		12	8,544	-25.9		12	8,291	-33.7		12	8,331	-33.0	
300----	12	9,584	-36.8		12	9,666	-34.2		12	9,142	-44.7		12	9,521	-38.4		12	9,642	-34.3		12	9,355	-41.5		12	9,398	-40.6	
250----	12	10,821	-46.1		12	10,920	-43.6		12	10,346	-50.9		12	10,750	-47.8		12	10,893	-44.0		12	10,570	-49.7		12	10,615	-48.8	
200----	12	12,271	-56.1		12	12,387	-54.5		12	11,784	-54.2		12	12,191	-56.8		12	12,358	-54.9		12	12,008	-56.3		12	12,053	-56.0	
175----	12	13,110	-60.7		12	13,231	-60.2		12	12,639	-54.1		12	13,030	-60.2						12	12,850	-58.2		12	12,896	-58.0	
150----	12	14,061	-64.8		12	14,180	-65.8		12	13,627	-54.6		12	13,985	-62.9						12	13,814	-60.0		12	13,864	-59.8	
125----	12	15,163	-68.5		12	15,274	-71.0		12	14,789	-55.4		12	15,098	-65.9						12	14,944	-62.0		12	14,996	-62.3	
100----	12	16,491	-70.8		12	16,586	-74.0		12	16,209	-55.9		12	16,444	-67.4						12	16,321	-62.9		12	16,365	-63.8	
80-----									12	17,632	-55.8		12	17,786	-65.9						12	17,699	-61.9		12	17,736	-62.8	
60-----													12	19,541	-62.6						12	19,486	-59.7		12	19,522	-60.1	
50-----																					12	20,633	-58.3					

Standard pressure surface (mb.)	EL PASO, TEX. (880 MB.)				ELY, NEV. (808 MB.)				GLASGOW, MONT. (939 MB.)				GRAND JUNCTION, COLO. (851 MB.)				GREAT FALLS, MONT. (886 MB.)				GREENSBORO, N. C. (987 MB.)				HATTERAS, N. C. (1018 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	1,195	19.3	33	12	1,908	7.8	46	12	648	3.8	64	12	1,474	10.5	47	12	1,128	5.2	58	12	273	12.5	76	12	3	16.8	83
1,000--	12	77			12	103			12	129			12	100			12	121			12	158			12	152	16.9	77
950----	12	535			12	546			12	555			12	545			12	553			12	595	14.3	59	12	594	14.8	68
900----	12	1,005			12	1,005			12	993	4.7	54	12	1,003			12	998			12	1,048	12.2	56	12	1,045	12.3	64
850----	12	1,495	19.2		12	1,483			12	1,458	2.8	53	12	1,481	10.3		12	1,464	4.9	50	12	1,525	9.6	59	12	1,523	9.9	58
800----	12	2,012	15.4		12	1,989	9.8	41	12	1,946	.4	54	12	1,989	10.5	37	12	1,956	2.1	52	12	2,026	7.2	56	12	2,025	7.6	53
750----	12	2,561	11.5		12	2,527	7.1	39	12	2,468	- 2.5	54	12	2,527	6.9	38	12	2,478	- 1.1	56	12	2,561	4.8	51	12	2,561	5.1	49
700----	12	3,128	7.3		12	3,086	2.8	43	12	3,006	- 5.8	54	12	3,085	2.7	41	12	3,022	- 4.6	58	12	3,116	2.1	46	12	3,115	2.4	44
650----	12	3,736	2.9		12	3,683	- 1.5	46	12	3,590	- 9.3	51	12	3,684	- 1.9	45	12	3,607	- 8.4	58	12	3,715	- .9	43	12	3,716	- .8	
600----	12	4,375	- 1.8		12	4,313	- 6.0	47	12	4,199	-12.8	48	12	4,311	- 6.5	49	12	4,218	-12.3	54	12	4,346	- 4.5		12	4,346	- 4.4	
550----	12	5,064	- 6.6		12	4,990	-10.8	48	12	4,862	-17.0	46	12	4,989	-11.3	48	12	4,882	-16.6	50	12	5,029	- 8.5		12	5,032	- 8.4	
500----	12	5,798	-11.6		12	5,715	-15.9	46	12	5,566	-21.8	44	12	5,709	-16.4		12	5,587	-21.4	47	12	5,759	-13.1		12	5,760	-13.0	
450----	12	6,602	-17.1		12	6,505	-21.1		12	6,338	-27.1		12	6,499	-21.8		12	6,360	-26.8	45	12	6,561	-18.3		12	6,562	-18.4	
400----	12	7,472	-23.2		12	7,360	-27.4		12	7,172	-33.1		12	7,351	-28.0		12	7,196	-32.8		12	7,424	-24.4		12	7,424	-24.5	
350----	12	8,435	-30.2		12	8,307	-34.5		12	8,098	-39.8		12	8,296	-35.0		12	8,122	-39.6		12	8,383	-31.4		12	8,382	-31.4	
300----	12	9,513	-38.2		12	9,367	-42.1		12	9,136	-46.8		12	9,354	-42.6		12	9,160	-46.9		12	9,457	-39.3		12	9,455	-39.4	
250----	12	10,742	-47.2		12	10,580	-50.2		12	10,326	-52.8		12	10,562	-50.6		12	10,350	-53.2		12	10,682	-48.0		12	10,679	-48.3	
200----	12	12,187	-56.2		12	12,015	-56.5		12	11,756	-54.3		12	11,996	-56.4		12	11,776	-55.5		12	12,127	-56.1		12	12,119	-56.5	
175----	12	13,029	-59.8		12	12,858	-57.6		12	12,613	-53.8		12	12,839	-57.7		12	12,626	-55.0		12	12,969	-58.8		12	12,960	-59.3	
150----	12	13,984	-63.1		12	13,829	-58.7		12	13,604	-53.9		12	13,808	-59.0		12	13,609	-54.9		12	13,929	-61.0		12	13,918	-61.4	
125----	12	15,097	-66.6		12	14,969	-60.6		12	14,774	-54.8		12	14,943	-61.0		12	14,766	-55.7		12	15,053	-63.3		12	15,040	-63.8	
100----	12	16,436	-69.2		12	16,353	-61.8		12	16,201	-55.4		12	16,321	-62.7		12	16,184	-56.3		12	16,420	-64.4		12	16,398	-64.9	
80-----	12	17,772	-67.6		12	17,734	-61.2		12	17,623	-55.6		12	17,697	-61.9		12	17,596	-56.7		12	17,782	-63.5		12	17,761	-63.8	
60-----	12	19,520	-63.0		12	19,531	-58.9		12	19,451	-55.5										12	19,565	-60.8		12	19,544	-60.9	
50-----									12	20,617	-55.2																	

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average annual values

Table 20—Continued

YEAR 1951

	HAVANA, CUBA (1011 MB.)				HILO, T. H. (1014 MB.)				INTERNAT. FALLS, MINN. (972 MB.)				JOLIET, ILL. (995 MB.)				LAKE CHARLES, LA. (1017 MB.)				LANDER, WYO. (827 MB.)				LAS VEGAS, NEV. (935 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	49	23.3	82	12	9	24.5	74	12	360	1.2	79	12	179	7.3	80	12	5	18.7	84	12	1,696	6.1	52	12	660	19.6	27
1,000--	12	145	23.6	79	12	130	23.3	77	12	127			12	133	.4		12	145	19.7	75	12	107			12	77		
950----	12	599	21.3	75	12	580	19.8	79	12	546	2.2	71	12	561	8.1	64	12	591	18.1	69	12	545			12	526		
900----	12	1,060	18.7	77	12	1,040	16.5	88	12	979	.7	69	12	1,003	6.3	64	12	1,049	16.0	64	12	1,000			12	993	20.4	
850----	12	1,550	16.0	67	12	1,526	13.6	81	12	1,437	- .8	67	12	1,471	4.5	60	12	1,534	13.9	57	12	1,472			12	1,482	16.8	
800----	12	2,063	13.8	57	12	2,036	11.6	77	12	1,920	- 2.6	66	12	1,963	2.6	54	12	2,043	11.7	51	12	1,973	7.1	44	12	1,995	13.0	
750----	12	2,611	11.3		12	2,583	10.1	51	12	2,436	- 4.8	57	12	2,489	.5	50	12	2,588	9.4		12	2,505	3.8	44	12	2,537	8.9	
700----	12	3,180	8.5		12	3,146	7.8		12	2,970	- 7.2	55	12	3,035	- 2.1	49	12	3,150	6.4		12	3,057	- .2	48	12	3,100	4.8	
650----	12	3,795	5.1		12	3,760	5.0		12	3,551	-10.2	53	12	3,627	- 5.2	47	12	3,759	2.9		12	3,650	- 4.4	49	12	3,702	.6	
600----	12	4,438	1.4		12	4,403	1.6		12	4,158	-13.6	55	12	4,245	- 8.8	44	12	4,398	- 1.0		12	4,271	- 8.6	50	12	4,336	- 3.9	
550----	12	5,139	- 2.7		12	5,100	- 2.5		12	4,818	-17.5	48	12	4,918	-12.7		12	5,091	- 5.4		12	4,943	-13.3		12	5,020	- 8.4	
500----	12	5,884	- 7.2		12	5,848	- 7.3		12	5,522	-22.1		12	5,636	-17.4		12	5,827	-10.3		12	5,658	-18.3	44	12	5,750	-13.6	
450----	12	6,707	-12.5		12	6,668	-12.7		12	6,291	-27.4		12	6,422	-22.8		12	6,638	-15.7		12	6,442	-23.8		12	6,548	-19.2	
400----	12	7,588	-18.8		12	7,550	-19.0		12	7,127	-33.5		12	7,270	-28.9		12	7,509	-21.9		12	7,287	-30.1		12	7,408	-25.6	
350----	12	8,568	-25.9		12	8,530	-26.2		12	8,049	-40.3		12	8,213	-35.6		12	8,476	-29.0		12	8,224	-37.1		12	8,362	-32.8	
300----	12	9,665	-34.3		12	9,626	-34.5		12	9,084	-47.4		12	9,267	-42.9		12	9,559	-37.1		12	9,272	-44.6		12	9,430	-40.7	
250----	12	10,915	-43.9		12	10,876	-43.9		12	10,272	-53.0		12	10,478	-50.3		12	10,794	-46.5		12	10,472	-52.1		12	10,648	-49.0	
200----	12	12,377	-54.8		12	12,340	-54.5		12	11,701	-54.2		12	11,912	-55.6		12	12,240	-56.2		12	11,897	-56.6		12	12,087	-56.2	
175----	12	13,220	-60.4		12	13,184	-60.0		12	12,553	-53.6		12	12,759	-57.0		12	13,081	-60.4		12	12,742	-56.8		12	12,930	-58.3	
150----	12	14,166	-66.1		12	14,134	-65.6		12	13,543	-53.8		12	13,729	-58.2		12	14,032	-64.2		12	13,717	-57.1		12	13,895	-60.5	
125----	12	15,259	-71.0		12	15,230	-70.6		12	14,707	-54.5		12	14,875	-59.6		12	15,135	-68.0		12	14,866	-58.2		12	15,024	-63.0	
100----	12	16,569	-74.2						12	16,130	-55.1		12	16,270	-60.5		12	16,466	-29.3		12	16,265	-59.2		12	16,392	-64.7	
80-----	12	17,864	-73.2						12	17,549	-55.3		12	17,660	-60.1		12	17,790	-69.4		12	17,659	-59.0		12	17,752	-63.9	
60-----																	12	19,524	-65.0		12	19,468	-57.7		12	19,529	-60.8	
50-----																	12	20,645	-61.7		12	20,616	-57.1		12	20,670	-59.0	
40-----																	12	22,037	-58.2						12	22,074	-57.2	

	LITTLE ROCK, ARK. (1007 MB.)				MAZATLAN, MEXICO (1009 MB.)				MEDFORD, ORE. (968 MB.)				MERIDA, MEXICO (1012 MB.)				MIAMI, FLA. (1018 MB.)				NANTUCKET, MASS. (1015 MB.)				NASHVILLE, TENN. (997 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	79	15.4	74	12	14	25.4	76	12	401	14.2	60	12	27	25.6		12	4	22.8		12	14	9.3	86	12	177	14.2	74
1,000--	12	139	15.9	68	12	91	25.0		12	126			12	128	25.1		12	155	22.9	77	12	139	10.3	78	12	146		
950----	12	580	15.6	63	12	549	23.7		12	564	14.6	52	12	582	23.0		12	603	20.1	74	12	568	9.1	69	12	583	14.3	61
900----	12	1,034	13.6	62	12	1,014	22.2		12	1,016	12.3	50	12	1,048	20.2		12	1,067	17.4	77	12	1,013	7.0	64	12	1,037	12.0	61
850----	12	1,515	11.6	59	12	1,509	19.5		12	1,492	9.1	53	12	1,540	17.1		12	1,554	14.8	63	12	1,481	4.9	60	12	1,514	9.8	58
800----	12	2,020	9.4	54	12	2,028	16.5		12	1,992	5.7	55	12	2,056	14.5		12	2,065	12.6	55	12	1,974	3.0	55	12	2,016	7.4	54
750----	12	2,559	7.0	48	12	2,581	13.3		12	2,523	2.5	54	12	2,603	12.0		12	2,608	10.1	47	12	2,501	.7	51	12	2,549	4.9	49
700----	12	3,118	4.0	45	12	3,152	9.7		12	3,071	- .7	49	12	3,174	9.1		12	3,175	7.2		12	3,047	- 1.9		12	3,105	2.1	46
650----	12	3,721	.5		12	3,768	5.7		12	3,666	- 4.0	42	12	3,791	5.8		12	3,785	3.9		12	3,637	- 4.9	44	12	3,704	- 1.2	
600----	12	4,354	- 3.3		12	4,413	1.5		12	4,286	- 7.9		12	4,436	2.1		12	4,428	.1		12	4,258	- 8.3	42	12	4,333	- 4.9	
550----	12	5,041	- 7.5		12	5,110	- 3.0		12	4,961	-12.1		12	5,136	- 2.0		12	5,123	- 3.9		12	4,932	-12.3		12	5,017	- 8.9	
500----	12	5,773	-12.3		12	5,857	- 7.8		12	5,679	-17.0		12	5,885	- 6.6		12	5,866	- 8.6		12	5,650	-16.8		12	5,745	-13.4	
450----	12	6,576	-17.6		12	6,675	-13.0		12	6,466	-22.4		12	6,708	-12.0		12	6,681	-13.9		12	6,439	-22.0		12	6,543	-18.7	
400----	12	7,442	-23.8		12	7,558	-18.8		12	7,318	-28.6		12	7,592	-18.0		12	7,560	-20.1		12	7,290	-28.0		12	7,406	-24.7	
350----	12	8,404	-30.8		12	8,537	-26.1		12	8,259	-35.8		12	8,575	-25.2		12	8,536	-27.3		12	8,236	-34.8		12	8,363	-31.7	
300----	12	9,479	-38.8		12	9,633	-34.4		12	9,315	-43.6		12	9,675	-33.6		12	9,627	-35.7		12	9,295	-42.3		12	9,435	-39.6	
250----	12	10,708	-47.7		12	10,882	-44.0		12	10,518	-51.7		12	10,927	-43.4		12	10,869	-45.4		12	10,505	-50.1		12	10,661	-48.3	
200----	12	12,153	-55.9		12	12,343	-55.2		12	11,940	-57.5		12	12,390	-54.9		12	12,323	-56.0		12	11,940	-56.1		12	12,102	-56.0	
175----	12	12,995	-59.0		12	13,187	-60.8		12	12,780	-58.1		12	13,230	-61.2		12	13,160	-61.2		12	12,784	-57.6		12	12,942	-58.6	
150----	12	13,956	-61.8		12	14,135	-66.4		12	13,751	-58.4		12	14,172	-67.3		12	14,102	-66.3		12	13,754	-58.6		12	13,903	-61.1	
125----	12	15,074	-64.7		12	15,220	-71.5		12	14,895	-59.7		12	15,254	-72.5		12	15,195	-70.2		12	14,895	-59.9		12	15,024	-63.8	
100----	12	16,429	-66.5						12	16,288	-60.9		12	16,548	-76.1		12	16,515	-72.4		12	16,281	-60.5		12	16,377	-65.1	
80-----	12	17,760	-65.2						12	17,673	-60.5						12	17,830	-70.9		12	17,675	-59.7		12	17,739	-64.4	
60-----	12	19,542	-61.8						12	19,475	-59.2						12	19,555	-65.5									
50-----	12	20,676	-59.3						12	20,621	-58.4						12	20,674	-61.7									

	NORTH PLATTE, NEBR. (917 MB.)				OAKLAND, CALIF. (1015 MB.)				OKLAHOMA CITY, OKLA. (970 MB.)				OMAHA, NEBR. (980 MB.)				PHOENIX, ARIZ. (972 MB.)				PITTSBURGH, PA. (972 MB.)				PORTLAND, ME. (1014 MB.)			
Standard pressure surface (mb.)	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	849	7.1	74	12	6	13.3	73	12	391	14.4	[illegible]	12	308	8.5	75	12	338	22.0	43	12	382	10.2	69	12	20	6.2	84
1,000--	12	119			12	135	12.9	72	12	125			12	135			12	87			12	145			12	133	7.9	76
950----	12	552			12	573	13.1	62	12	565	15.4	59	12	565	8.8	64	12	540	24.1		12	578	10.4	63	12	560	7.2	69
900----	12	998	8.6	61	12	1,021	13.4	47	12	1,020	14.1	55	12	1,008	7.4	66	12	1,007	20.9		12	1,024	8.2	62	12	1,000	5.1	68
850----	12	1,471	7.6	55	12	1,500	11.5		12	1,501	12.4	52	12	1,478	5.9	60	12	1,498	17.1		12	1,494	5.7	62	12	1,466	3.3	65
800----	12	1,969	5.6	53	12	2,005	8.9		12	2,008	10.1	50	12	1,973	4.1	55	12	2,011	13.2	33	12	1,988	3.4	58	12	1,956	1.4	62
750----	12	2,500	3.0	51	12	2,542	6.0		12	2,548	7.3	46	12	2,503	2.0	49	12	2,555	9.3	34	12	2,516	1.1	53	12	2,480	- .9	57
700----	12	3,051	- .2	49	12	3,098	2.8		12	3,107	4.0	44	12	3,051	- .7	47	12	3,117	5.3		12	3,062	- 1.4	48	12	3,022	- 3.5	53
650----	12	3,646	- 3.8	48	12	3,699	- .9		12	3,710	.5		12	3,646	- 4.0	46	12	3,723	1.4		12	3,655	- 4.4	45	12	3,610	- 6.5	49
600----	12	4,268	- 7.8	47	12	4,328	- 4.9		12	4,343	- 3.6		12	4,267	- 7.7	45	12	4,357	- 2.8		12	4,277	- 7.9		12	4,226	- 9.9	
550----	12	4,944	-12.3	44	12	5,008	- 9.4		12	5,028	- 8.1		12	4,944	-12.1		12	5,044	- 7.4		12	4,951	-11.7		12	4,897	-13.7	
500----	12	5,660	-17.2		12	5,736	-14.5		12	5,758	-12.8		12	5,662	-17.0		12	5,776	-12.4		12	5,672	-16.2		12	5.611	-18.3	
450----	12	6,448	-22.6		12	6,532	-20.2		12	6,559	-18.2		12	6,450	-22.2		12	6,577	-18.0		12	6,463	-21.4		12	6,393	-23.7	
400----	12	7,296	-28.8		12	7,389	-26.5		12	7,423	-24.3		12	7,301	-28.3		12	7,443	-24.4		12	7,317	-27.5		12	7,240	-29.7	
350----	12	8,238	-35.8		12	8,339	-33.7		12	8,384	-31.4		12	8,245	-35.3		12	8,401	-31.5		12	8,264	-34.5		12	8,178	-36.4	
300----	12	9,293	-43.4		12	9,401	-41.7		12	9,456	-39.4		12	9,303	-43.0		12	9,475	-39.4		12	9,326	-42.1		12	9,230	-43.6	
250----	12	10,499	-50.9		12	10,615	-49.9		12	10,680	-48.1		12	10,513	-50.7		12	10,699	-48.0		12	10,537	-49.9		12	10,436	-50.9	
200----	12	11,930	-56.4		12	12,049	-56.8		12	12,125	-56.0		12	11,947	-56.2		12	12,141	-56.0		12	11,975	-55.9		12	11,867	-55.4	
175----	12	12,774	-57.3		12	12,892	-58.5		12	12,966	-58.9		12	12,796	-57.3		12	12,986	-59.0		12	12,820	-57.4		12	12,720	-56.4	
150----	12	13,744	-58.2		12	13,858	-59.7		12	13,927	-61.6		12	13,769	-58.4		12	13,947	-61.9		12	13,791	-58.7		12	13,701	-57.3	
125----	12	14,886	-59.9		12	14,992	-61.6		12	15,051	-64.5		12	14,915	-60.1		12	15,068	-65.0		12	14,935	-60.0		12	14,857	-58.5	
100----	12	16,277	-61.1		12	16,370	-63.2		12	16,406	-66.1		12	16,304	-61.1		12	16,416	-67.2		12	16,322	-60.9		12	16,260	-59.1	
80-----	12	17,668	-60.5		12	17,740	-62.4		12	17,765	-64.7		12	17,698	-60.5						12	17,713	-60.2		12	17,655	-58.6	
60-----	12	19,468	-58.9		12	19,523	-60.1		12	19,537	-61.5		12	19,503	-58.8													
50-----	12	20,618	-57.9		12	20,666	-58.5																					

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

RADIOSONDE DATA

Average annual values

Table 20—Continued

YEAR 1951

Standard pressure surface (mb.)	RAPID CITY, S.DAK. (904 MB.)				ST. CLOUD, MINN. (977 MB.)				SAN ANTONIO, TEX. (987 MB.)				SAN JUAN, P. R. (1014 MB.)				SANTA MARIA, CALIF. (1007 MB.)				S. STE. MARIE, MICH. (989 MB.)				SPOKANE, WASH. (931 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	966	4.8	66	12	317	3.3	79	12	240	20.4	62	12	19	24.9	82	12	71	12.0	83	12	221	3.2	75	12	722	9.5	60
1,000--	12	125			12	128			12	128			12	142	24.5	79	12	134	12.5	79	12	125			12	118		
950----	12	555			12	552	4.4	70	12	577	19.8	61	12	595	21.7	79	12	575	13.5	63	12	548	3.9	73	12	552		
900----	12	1,000	5.0		12	987	3.5	66	12	1,038	17.6	66	12	1,059	18.7	[illegible]	12	1,022	14.6	44	12	982	2.2	77	12	[illegible]	9.0	54
850----	12	1,470	6.1	53	12	1,449	1.9	63	12	1,526	15.5	60	12	1,548	15.9	75	12	1,503	13.0	37	12	1,442	.3	66	12	1,470	6.2	53
800----	12	1,965	3.6	53	12	1,937	.0	59	12	2,038	13.3	55	12	2,063	13.8	66	12	2,010	10.1	36	12	1,927	- 1.8	61	12	1,964	2.8	54
750----	12	2,491	.7	54	12	2,460	- 2.2	56	12	2,584	10.8	44	12	2,609	11.4		12	2,550	7.3	32	12	2,445	- 3.9	57	12	2,487	- .7	55
700----	12	3,037	- 2.5	53	12	2,998	- 4.8	55	12	3,151	7.8		12	3,179	8.7		12	3,108	4.2		12	2,980	- 6.4	54	12	3,031	- 4.1	52
650----	12	3,627	- 6.0	51	12	3,585	- 7.8	50	12	3,762	4.2		12	3,794	5.4		12	3,712	.6		12	3,563	- 9.4	50	12	3,616	- 7.7	49
600----	12	4,244	-10.0	49	12	4,197	-11.3	47	12	4,405	.1		12	4,439	1.9		12	4,345	- 3.5		12	4,172	-12.8	48	12	4,229	-11.5	46
550----	12	4,914	-14.4	46	12	4,864	-15.4		12	5,098	- 4.4		12	5,141	- 2.0		12	5,029	- 8.0		12	4,834	-16.7		12	4,893	-15.7	
500----	12	5,626	-19.1	43	12	5,573	-20.0	44	12	5,841	- 9.2		12	5,888	- 6.5		12	5,761	-13.1		12	5,541	-21.3	44	12	5,603	-20.5	
450----	12	6,404	-24.4		12	6,350	-25.3	42	12	6,652	-14.8		12	6,713	-11.6		12	6,559	-18.8		12	6,315	-26.4		12	6,377	-25.8	
400----	12	7,249	-30.6		12	7,191	-31.3		12	7,529	-21.1		12	7,597	-17.7		12	7,423	-25.3		12	7,154	-32.3		12	7,216	-32.0	
350----	12	8,184	-37.5		12	8,122	-38.1		12	8,501	-28.2		12	8,582	-24.9		12	8,378	-32.5		12	8,083	-38.9		12	8,145	-38.7	
300----	12	9,230	-45.1		12	9,168	-45.3		12	9,587	-36.4		12	9,683	-33.3		12	9,446	-40.4		12	9,124	-45.9		12	9,186	-45.9	
250----	12	10,429	-52.0		12	10,366	-51.7		12	10,827	-45.7		12	10,938	-43.1		12	10,666	-49.0		12	10,323	-52.1		12	10,381	-52.3	
200----	12	11,858	-55.6		12	11,800	-54.6		12	12,281	-55.6		12	12,404	-54.7		12	12,103	-56.4		12	11,755	-54.7		12	11,810	-55.2	
175----	12	12,708	-55.7		12	12,655	-54.8		12	13,123	-59.9		12	13,247	-60.8		12	12,943	-58.8		12	12,612	-54.7		12	12,663	-54.9	
150----	12	13,687	-56.4		12	13,638	-55.3		12	14,076	-63.9		12	14,190	-67.0		12	13,907	-60.8		12	13,598	-55.0		12	13,648	-54.6	
125----	12	14,840	-57.6		12	14,801	-56.3		12	15,181	-67.6		12	15,275	-72.1		12	15,033	-63.5		12	14,758	-55.8		12	14,814	-55.5	
100----	12	16,244	-58.5		12	16,213	-56.9		12	16,514	-70.1		12	16,577	-75.2		12	16,397	-65.3		12	16,174	-56.7		12	16,233	-56.2	
80-----	12	17,649	-58.4		12	17,629	-56.9		12	17,837	-69.0		12	17,868	-74.8		12	17,755	-64.3		12	17,586	-56.9		12	17,650	-55.9	
60-----					12	19,472	-56.4		12	19,575	-63.9		12	19,560	-68.5		12	19,527	-61.5						12	19,478	-55.7	
50-----																	12	20,668	-59.6						12	20,646	-55.2	

Standard pressure surface (mb.)	SWAN ISLAND, W. I. (1013 MB.)				TACUBAYA, MEXICO (774 MB.)				TAMPA, FLA. (1018 MB.)				TATOOSH ISLAND, WASH. (1012 MB.)				WASHINGTON, D.C. (1008 MB.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
SURFACE	12	10	25.9	82	12	2,306	16.6		12	9	20.7	81	12	31	8.8	80	12	88	11.9	74
1,000--	12	125	25.8	88	12	58			12	160	21.1	77	12	129	8.7	88	12	153	12.9	68
950----	12	583	22.6	81	12	531			12	607	19.3	68	12	557	7.9	71	12	586	11.8	62
900----	12	1,046	19.6	79	12	997			12	1,068	16.8	66	12	998	6.1	66	12	1,035	9.5	62
850----	12	1,537	16.8	73	12	1,492			12	1,554	14.2	62	12	1,465	3.8	61	12	1,508	7.2	61
800----	12	2,052	14.4	66	12	2,024			12	2,064	11.9	55	12	1,955	1.3	57	12	2,006	4.9	57
750----	12	2,599	12.0		12	2,577	15.2		12	2,607	9.3	47	12	2,477	- 1.4	53	12	2,536	2.6	52
700----	12	3,171	9.2		12	3,152	11.1		12	3,171	6.6		12	3,018	- 4.3	49	12	3,085	- .2	48
650----	12	3,787	6.1		12	3,772	6.6		12	3,782	3.4		12	3,604	- 7.6	45	12	3,681	- 3.2	44
600----	12	4,434	2.5		12	4,420	1.9		12	4,422	- .3		12	4,218	-11.2	44	12	4,305	- 6.7	
550----	12	5,133	- 1.6		12	5,121	- 2.4		12	5,116	- 3.6		12	4,884	-15.4	42	12	4,982	-10.6	
500----	12	5,884	- 6.2		12	5,868	- 6.8		12	5,857	- 9.1		12	5,594	-20.0		12	5,706	-15.2	
450----	12	6,705	-11.3		12	6,692	-11.8		12	6,671	-14.4		12	6,370	-25.4		12	6,499	-20.4	
400----	12	7,595	-17.2		12	7,576	-17.8		12	7,548	-20.4		12	7,211	-31.6		12	7,356	-26.6	
350----	12	8,582	-24.3		12	8,560	-25.1		12	8,521	-27.6		12	8,143	-38.3		12	8,306	-33.6	
300----	12	9,686	-32.8		12	9,660	-33.5		12	9,611	-35.9		12	9,186	-45.7		12	9,369	-41.3	
250----	12	10,943	-42.7		12	10,917	-43.4		12	10,852	-45.5		12	10,380	-52.6		12	10,583	-49.6	
200----	12	12,411	-54.3		12	12,384	-55.0		12	12,306	-55.6		12	11,804	-56.7		12	12,018	-56.5	
175----	12	13,254	-60.5		12	13,223	-61.1		12	13,146	-60.1		12	12,651	-56.5		12	12,861	-58.5	
150----	12	14,198	-67.0						12	14,096	-64.5		12	13,633	-56.2		12	13,825	-60.0	
125----	12	15,282	-72.8						12	15,199	-68.3		12	14,790	-56.7		12	14,956	-61.8	
100----	12	16,577	-76.4						12	16,528	-70.8		12	16,201	-57.0		12	16,332	-62.7	
80-----	12	17,864	-75.5						12	17,854	-69.8		12	17,614	-57.0		12	17,709	-61.6	
60-----	12	19,551	-68.8						12	19,586	-65.0		12	19,433	-56.4		12	19,501	-59.5	
50-----	12	20,652	-64.1						12	20,708	-61.6									
40-----	12	22,034	-59.4																	

Note: All observations scheduled at 0300, G.C.T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G.C.T., "Number of observations" refers to those of dynamic height only. Temperature and humidity data may be missing for one or more pressure surfaces of some observations. The temperature values are based on 15 or more observations at the surface or 5 observations at a standard pressure level. Relative humidity data are not published for standard pressure surfaces having less than 16 actual observations.

Relative humidity data beginning with October 1, 1948, were computed and expressed in these tables on the basis of vapor-pressure over water. Upper air values of relative humidity at levels with temperatures less than 0°C, have formerly been computed and expressed on the basis of the vapor-pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the value occurring below the operating range of the humidity element.

These average values for standard pressure surfaces were obtained by radiosondes; dynamic height (geopotential) in units of .98 dynamic meter, temperature in degrees centigrade and relative humidity in percent.

PILOT BALLOON DATA

Table 21

Average annual resultant winds

YEAR 1951

Altitude (meters) m. s. l.	Abilene, Tex. (534 m.)			Albuquerque, N.Mex. (1,627 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N.Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S.C. (16 m.)			Cincinnati, Ohio (273 m.)			El Paso, Tex. (1,198 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	362	194	2.1	365	238	2.1	346	299	1.4	348	302	1.4	354	319	1.5	359	130	5.2	342	241	3.1	340	225	1.0	359	208	1.4	335	241	1.8	363	239	2.9
500	---	---	----	---	---	----	---	---	----	---	---	----	---	---	----	350	144	6.0	342	246	4.6	340	221	2.7	355	220	2.0	335	240	2.6	---	---	----
1,000	355	200	3.8	---	---	----	---	---	----	339	288	2.7	354	311	1.5	296	157	5.3	281	247	6.3	304	241	4.2	339	257	2.7	309	245	4.1	---	---	----
1,500	[illegible]	211	4.5	---	---	----	345	267	3.4	300	286	4.2	351	285	2.1	246	173	4.0				246	255	5.5	320	280	4.3	273	255	5.6	363	240	3.4
2,000	328	229	5.4	365	246	3.4	332	272	4.8	266	287	5.7	339	274	3.4	211	186	3.2				190	268	6.7	290	285	6.0	247	266	7.1	363	245	3.9
2,500	314	240	6.3	363	256	4.4	304	274	6.6	240	290	7.4	311	274	4.6	172	203	2.8							270	284	7.0	221	274	8.5	357	254	4.8
3,000	292	254	7.4	355	267	5.8	278	275	8.4	221	289	9.1	282	272	5.4	160	230	2.7							253	283	7.9	190	279	10.0	350	259	6.2
4,000	279	264	9.8	325	275	8.6	229	277	10.6	193	291	11.3	247	275	7.9										224	280	10.3				329	264	8.6
5,000	242	271	11.3	295	276	11.0	184	282	12.2																197	280	11.5				312	263	10.5
6,000	217	278	12.7	274	276	13.2																									290	265	11.8
8,000				219	275	15.2																									246	266	15.3
10,000																															194	269	18.3

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N.C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	361	237	1.6	364	294	2.3	341	276	1.2	347	278	1.5	351	80	1.4	331	237	2.0	339	201	1.1	342	310	1.4	363	108	2.8	349	185	1.1	336	261	1.1
500	---	---	----	---	---	----	341	263	1.6	---	---	----	347	144	.9	330	239	2.9	338	220	2.4	342	308	1.5	362	108	3.4	341	204	1.7	336	241	2.3
1,000	---	---	----	---	---	----	335	254	3.2	347	267	3.2	334	241	1.7	285	241	4.5	315	230	3.6	341	282	1.1	355	106	2.2	305	258	1.6	312	242	3.6
1,500	---	---	----	364	294	2.4	319	266	4.8	322	270	5.2	307	269	3.0	257	250	6.2	280	251	5.3	316	242	1.9	343	86	.8	249	298	2.9	280	253	4.6
2,000	361	244	1.7	364	283	2.8	293	279	6.4	289	273	6.5	270	278	4.1	224	261	7.9	246	264	7.0	282	237	2.2	328	300	.9	195	302	3.9	255	263	6.0
2,500	361	251	2.5	355	260	3.5	275	284	8.2	255	275	7.5	250	282	5.1	190	270	8.7	226	270	8.0				310	286	1.6				234	270	7.2
3,000	346	257	3.3	342	255	5.0	250	286	9.7	223	277	8.2	227	279	5.9				209	275	9.3				299	281	2.0				212	274	8.5
4,000	303	273	5.4	303	263	7.0	221	286	11.5				195	281	7.7										256	278	3.2				183	277	10.5
5,000	260	279	8.1	262	272	9.4	189	282	13.9																218	280	4.7						
6,000	231	282	10.7																														

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	352	269	3.2	346	201	2.8	351	306	0.8	365	245	0.6	353	354	2.3	325	286	1.3	325	218	1.5	354	143	2.4	354	261	3.3	316	284	1.5	337	251	2.0
500	343	279	2.9	344	203	3.0	351	275	1.0	365	240	1.0	---	---	----	325	285	1.6	325	226	2.7	354	149	3.1	345	284	2.5	316	277	2.5	337	233	2.1
1,000	305	296	2,0	338	208	4.2	308	248	2.3	362	231	1.6	353	353	2.3	300	279	2.7	296	239	4.4	343	161	3.3	318	284	1.4	284	269	3.1	292	223	2.0
1,500	293	298	2.2	318	226	6.1	278	260	4.3	358	224	2.1	347	314	3.1	262	277	4.5	269	253	6.3	321	183	3.2	305	288	1.1	239	268	3.6	257	226	1.7
2,000	278	299	2.2	299	241	7.8	257	267	6.5	351	227	2.7	310	289	4.3	244	284	6.5	248	262	8.1	301	211	3.4	291	286	1.4	210	277	4.6	242	240	2.1
2,500	267	306	2.5	292	249	8.9	241	277	8.4	340	240	3.4	282	286	6.2	215	287	8.1	225	266	10.1	278	238	3.9	282	272	1.7						
3,000	262	307	2.9	281	260	10.0	229	280	10.3	331	251	4.0	246	283	8.3	204	287	9.7	207	271	11.4	268	250	5.0	281	261	2.4						
4,000	247	303	4.2	247	269	12.1				304	258	5.9							171	275	13.5	239	267	7.3	256	261	4.1						
5,000				223	276	13.8				283	263	7.4										206	272	9.9	238	263	5.3						
6,000				192	279	14.6				246	267	8.2													230	267	6.2						

Altitude (meters) m. s. l.	Spokane, Wash. (725 m.)			Washington, D.C. (24 m.)		
	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	330	220	1.9	340	265	1.0
500	---	---	----	340	260	2.6
1,000	330	228	2.8	327	264	4.4
1,500	313	234	4.0	313	271	6.1
2,000	280	241	4.4	277	280	7.6
2,500				262	283	9.4
3,000				237	283	10.9
4,000				203	284	13.1
5,000				174	285	14.6

These free-air resultant winds are based on pilot balloon observations made near 2100 G. C. T.; directions in degrees from North (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second.

RAWIN DATA

Table 22

Average annual resultant winds

YEAR 1951

Altitude (meters) m. s. l	Albuquerque, N.Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Burrwood, La. (3 m.)			Caribou, Me. (191 m.)			Charleston, S.C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N.C. (275 m.)			Hatteras, N.C. (3 m.)		
	No of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No of observations	Direction	Speed	No of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed	No. of observations	Direction	Speed
Surface	365	128	0.8	365	147	4.0	365	6	0.7	365	122	3.5	354	149	1.7	365	267	1.6	365	224	0.7	363	160	0.5	365	33	0.8	363	267	0.3	360	281	0.9
500	---	---	----	---	---	----	---	---	----	360	141	6.9	363	119	.7	365	270	3.6	358	221	2.4	362	209	2.4	---	---	----	359	233	1.8	348	268	2.5
1,000	---	---	----	365	168	5.5	362	307	2.4	360	148	6.0	352	155	1.1	362	277	4.3	356	251	3.0	362	236	4.2	---	---	----	357	251	3.5	341	272	3.5
1,500	---	---	----	363	198	5.4	360	298	3.8	361	160	4.6	349	214	.5	360	275	5.2	353	271	3.6	361	256	5.6	363	31	.7	355	266	4.8	337	278	4.6
2,000	365	269	3.2	361	226	5.2	357	295	5.6	362	175	3.4	349	253	1.3	359	270	6.5	352	276	4.6	361	266	7.0	361	263	1.6	349	274	6.0	340	276	5.7
2,500	365	271	5.1	356	244	6.1	356	295	7.0	360	194	2.8	350	258	2.6	356	267	7.5	353	276	5.8	360	271	8.3	361	253	3.4	345	277	7.0	337	273	6.9
3,000	364	272	6.4	348	258	7.0	355	294	8.2	359	223	2.8	353	260	3.9	353	264	8.8	350	278	6.7	359	273	9.5	361	257	4.9	343	277	8.2	338	274	8.1
4,000	361	273	8.2	324	272	8.2	349	288	10.1	356	250	3.8	343	265	6.2	351	262	11.1	340	275	8.5	351	274	11.8	362	266	7.1	340	278	10.3	330	275	9.7
5,000	343	273	10.2	304	276	9.7	339	287	11.8	352	262	5.4	333	267	8.0	343	260	13.0	332	278	10.0	344	273	13.7	361	271	9.3	326	278	12.4	317	274	11.6
6,000	328	273	11.6	279	275	10.6	330	283	13.3	344	265	6.7	324	272	9.2	333	260	14.3	320	279	11.5	321	273	14.8	342	272	11.2	311	278	13.7	303	274	12.3
8,000							303	280	16.4	325	272	9.5	306	273	12.0	296	261	16.7	288	280	14.4	283	270	17.9	283	273	12.9	278	278	16.6	268	276	14.9
10,000							255	271	18.6	289	268	12.0	283	276	14.4	259	262	19.9															
12,000							192	276	17.6																								

	Internat'l. Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (12 m.)			Nantucket, Mass. (14 m.)			Nashville, Tenn. (180 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			San Antonio, Tex. (242 m.)			San Juan, P.R. (28 m.)		
Surface	357	267	0.5	363	192	0.2	365	330	1.9	365	66	1.1	350	295	0.9	360	214	0.7	365	278	2.4	353	132	2.4	364	4	1.7	365	117	3.1	364	124	2.5
500	348	282	1.0	358	201	2.9	360	327	2.0	365	98	3.0	339	273	4.3	357	214	2.5	363	285	3.7	309	138	2.3	---	---	----	364	136	5.6	357	[illegible]	6.6
1,000	346	281	2.4	353	227	4.0	359	311	2.3	365	100	2.7	336	274	5.2	349	232	4.4	362	290	3.6	304	193	3.7	363	2	1.6	362	156	5.5	357	90	6.6
1,500	341	288	3.9	344	245	5.3	356	271	2.6	365	110	1.5	334	270	6.3	345	250	5.8	362	292	3.0	301	228	4.7	363	307	2.6	362	184	4.1	357	89	6.0
2,000	336	294	5.2	337	256	5.9	356	254	3.7	365	161	.6	328	268	7.5	345	260	7.1	361	293	3.0	306	245	6.1	360	297	4.5	362	218	3.7	357	86	5.4
2,500	336	293	6.2	330	266	7.0	356	259	4.6	364	243	1.1	324	268	8.8	335	267	7.8	361	293	3.4	314	258	7.6	357	296	6.1	359	240	4.1	358	85	4.7
3,000	334	292	7.1	327	273	8.3	356	268	5.9	364	262	2.0	317	266	9.8	331	270	9.1	358	294	4.2	313	266	8.5	352	292	8.0	356	252	4.6	360	90	4.4
4,000	322	290	9.4	311	278	9.8	341	279	7.0	361	273	3.2	300	267	12.0	318	275	10.7	355	290	5.6	310	272	10.1	346	286	11.0	347	266	6.1	357	79	2.8
5,000	320	286	11.6	291	284	11.2	325	285	8.6	357	274	4.9	278	267	14.0				349	286	7.0	311	276	12.1	339	283	13.4	334	270	7.2	354	57	1.7
6,000	307	285	12.8				295	283	9.5	354	276	6.6	254	269	14.7				334	280	10.4	303	275	13.4	329	281	15.3	313	268	8.1	348	350	1.1
8,000	261	277	15.2				253	285	11.1	336	284	9.6							280	280	10.2	271	271	16.0	299	274	18.9	269	266	10.8	337	285	4.1
10,000	204	273	18.4							330	286	13.2													251	269	21.1				330	284	8.8
12,000										304	288	16.6																			315	278	12.9
14,000										251	293	12.8																			286	283	12.6

	St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
Surface	364	320	0.4	365	283	1.9	359	337	0.2	358	206	1.2	358	180	1.9
500	355	281	1.0	362	337	2.7	357	258	1.3	---	---	----	355	239	2.2
1,000	354	281	2.8	362	343	2.8	351	268	3.1	352	225	2.4	350	245	2.5
1,500	349	283	4.6	363	353	2.4	341	274	4.7	350	245	3.8	346	247	2.6
2,000	349	288	6.1	364	344	2.2	333	277	5.7	347	257	4.6	341	262	3.2
2,500	350	289	7.3	363	315	2.7	326	276	6.5	339	266	5.1	337	273	4.1
3,000	353	289	8.5	360	301	3.6	323	275	7.3	337	271	5.9	336	278	4.9
4,000	345	286	11.1	356	292	5.3	298	276	9.2	335	278	8.1	328	280	6.9
5,000	339	282	13.3	343	284	6.4	271	278	10.9	330	276	10.4	316	284	8.9
6,000	325	278	15.1	335	280	8.2	249	279	11.8	306	282	11.5	297	285	10.7
8,000	281	273	18.2	311	274	9.7	197	276	15.0	253	277	12.7	247	283	12.2
10,000				293	267	12.3									

These free-air resultant winds are based on rawin observations made near 0300 G. C. T.; directions in degrees from north (N = 360°, E = 90°, S = 180°, W = 270°); speeds in meters per second. Annual values are not computed for any level having less than 10 monthly values or having more than 1 monthly value missing in a single season.

SOLAR RADIATION DATA

Table 30--Average daily values (direct and diffuse) received on a horizontal surface, tabulated in langleys, and the percentages of normal

YEAR 1951

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%
Aklavik, MacKenzie	10	100	56	92	218	102	370	96	516	102	484	98	442	97	319	108	125	84	79	104	12	75	---	---	---	---
Albuquerque, N. Mex.	307	100	388	106	485	98	600	99	674	100	778	104	691	103	620	100	600	110	452	97	335	96	269	91	517	101
Amherst, Mass.	138	97	---	---	271	99	---	---	433	93	466	93	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Annette Island, Alaska	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Apalachicola, Fla.	314	97	417	100	435	99	532	101	614	109	602	101	548	96	535	98	392	88	459	112	321	90	233	90	450	99
Atlanta, Ga.	244	---	306	---	359	---	---	---	653	---	580	---	623	---	548	---	---	---	400	---	271	---	---	---	---	---
Barrow, Alaska	---	---	---	---	---	---	---	---	554	---	562	---	423	---	261	---	46	---	22	---	2	---	0	100	---	---
Bethel, Alaska	---	---	90	---	274	---	356	---	433	---	419	---	318	---	199	---	199	---	148	---	---	---	---	---	---	---
Big Spring, Tex.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	297	---	265	---	---	---
Bismarck, N. Dak.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	466	86	362	98	253	98	---	---	---	---	---	---
Blue Hill, Mass.	150	92	215	86	257	79	424	107	500	105	487	94	501	101	413	89	366	101	224	77	158	97	143	106	320	95
Blue Hill, Mass. DIFFUSE RADIATION	74	---	94	---	124	---	146	---	154	---	212	---	212	---	176	---	115	---	84	---	61	---	57	---	126	---
Boise, Idaho	142	106	201	92	340	99	545	101	596	102	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Boston, Mass.	126	102	177	88	235	80	388	108	491	109	488	99	495	108	389	96	354	110	225	89	150	110	131	119	304	101
Brownsville, Tex.	311	93	415	105	438	91	519	100	564	97	676	96	688	103	626	99	525	100	485	100	314	95	297	92	488	100
Canton Island, Pacific Area	647	---	713	---	691	---	600	---	---	---	537	---	---	---	---	---	---	---	---	---	574	---	579	---	---	---
Caribou, Maine	---	---	---	---	---	---	288	63	462	96	526	99	513	94	407	89	392	108	236	93	125	102	---	---	---	---
Charleston, S. C.	263	105	365	109	404	90	536	96	627	101	570	97	538	100	535	102	418	102	319	98	285	93	219	103	423	99
Cleveland, Ohio	121	120	166	91	301	108	349	83	550	95	552	92	586	99	528	101	397	86	286	101	136	103	---	---	---	---
Columbia, Mo.	181	112	212	84	323	97	413	93	578	118	462	82	560	93	512	102	423	96	302	86	212	107	172	96	363	97
Columbus, Ohio	133	---	190	---	302	---	384	---	551	---	---	---	564	---	488	---	415	---	289	---	---	---	120	---	---	---
Davis, Calif.	139	70	246	89	433	113	514	96	638	99	682	95	691	98	662	106	538	108	379	105	217	107	159	102	442	100
Dodge City, Kans.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	294	---	229	---	---	---
East Lansing, Mich.	90	87	143	81	211	82	269	77	440	116	425	96	439	98	393	101	315	111	209	94	123	119	94	101	263	97
East Wareham, Mass.	135	90	192	90	259	88	426	105	475	102	481	94	498	104	427	94	363	105	235	87	165	97	130	88	316	97
Edmonton, Alberta	96	97	191	98	342	103	415	96	456	97	563	114	491	104	423	105	310	101	172	105	97	94	73	109	302	102
El Paso, Tex.	364	101	446	106	---	---	690	101	748	102	786	106	694	102	---	---	610	107	483	100	366	95	297	91	---	---
Ely, Nevada	---	---	309	---	458	---	544	---	617	---	656	---	678	106	599	99	561	110	---	---	---	---	---	---	---	---
Eureka Sound	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Fairbanks, Alaska	15	100	73	97	243	119	399	108	531	115	554	109	483	108	---	---	181	98	101	125	24	92	6	100	---	---
Fort Worth, Tex.	282	103	358	108	465	99	589	116	604	104	632	100	686	110	674	110	537	111	427	99	310	90	267	114	486	106
Fresno, Calif.	168	93	332	118	481	115	540	95	696	107	737	103	742	106	---	---	---	---	433	116	274	110	171	104	---	---
Gainesville, Fla.	291	106	388	114	430	100	472	90	612	109	493	96	516	104	---	---	---	---	---	---	---	---	---	---	---	---
Glasgow, Mont.	166	106	256	105	426	109	511	102	650	102	---	---	684	104	534	98	402	106	257	105	184	106	---	---	---	---
Grand Junction, Colo.	---	---	---	---	---	---	---	---	---	---	---	---	700	---	576	---	578	---	397	---	262	---	212	---	---	---
Grand Lake, Colo.	---	---	313	101	---	---	470	85	567	96	605	95	643	106	539	100	519	111	298	83	---	---	153	92	---	---
Great Falls, Mont.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Greensboro, N. C.	---	---	321	---	356	---	471	---	527	---	513	---	555	---	478	---	405	---	366	---	319	---	---	---	---	---
Griffin, Ga.	259	90	325	108	368	115	563	99	670	108	589	96	606	103	585	104	433	103	413	112	257	91	199	100	439	103
Hatteras, N. C.	241	95	---	---	---	---	---	---	---	---	---	---	---	---	539	94	446	104	321	93	265	96	209	102	---	---
Honolulu, T.H.	427	101	426	98	421	96	576	102	660	105	673	107	665	103	660	106	574	97	485	94	446	103	333	88	529	101
Indianapolis, Ind.	---	---	---	---	---	---	---	---	---	---	491	96	546	97	486	98	382	98	290	96	159	93	125	89	---	---
Inyokern, Calif.	304	97	433	99	554	99	640	100	756	100	810	106	767	102	---	---	---	---	---	---	---	---	---	---	---	---
Ithaca, N. Y.	97	82	183	89	255	102	344	108	556	126	467	92	531	106	472	103	343	97	237	93	128	99	94	89	309	102
Joliet, Ill.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Keflavik, Iceland	8	---	56	---	207	---	287	---	312	---	510	---	---	---	402	---	181	---	72	101	31	103	11	138	---	---
Lake Charles, La.	269	95	339	112	392	94	496	103	585	102	590	101	536	103	564	101	401	93	445	114	306	89	231	104	430	101
Lander, Wyo.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Las Vegas, Nev.	274	105	374	107	498	94	565	99	635	99	735	98	664	97	579	92	547	99	407	101	297	94	225	98	483	98
Lexington, Ky.	167	---	242	---	301	---	447	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lincoln, Nebr.	218	117	241	96	345	102	350	82	502	100	440	79	525	91	479	100	315	77	---	---	---	---	---	---	---	---
Little Rock, Ark.	---	---	---	---	---	---	---	---	628	---	526	---	539	---	550	---	---	---	---	---	230	---	186	---	---	---
Los Angeles, Calif. (WBAS)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	307	---	233	---	---	---
Los Angeles, Calif. (WBO)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	254	---	200	---	---	---
Lynn, Mass.	127	93	188	96	240	96	394	103	462	99	480	92	510	101	403	93	347	98	195	82	134	95	98	92	298	96
Madison, Wis.	168	115	189	88	285	90	337	83	498	106	503	97	529	98	407	89	370	103	232	89	170	113	117	98	317	96
Medford, Ore.	124	117	215	103	375	112	568	99	642	85	784	112	753	99	629	93	478	101	282	98	154	103	91	93	425	100
Miami, Fla.	---	---	---	---	---	---	558	117	618	123	620	129	525	111	549	118	499	121	411	112	370	111	335	114	---	---
Nashville, Tenn.	139	98	249	122	282	96	420	100	593	119	541	103	577	114	548	121	449	115	319	105	177	84	160	127	371	109
Newport, R. I.	138	87	216	94	296	91	472	113	538	111	501	94	556	110	479	105	422	115	267	90	179	99	143	101	351	103
New York, N. Y.	136	111	208	109	288	111	406	112	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
North Head, Wash.	100	---	181	---	269	95	---	---	518	109	537	106	481	100	483	109	268	88	208	116	96	93	86	116	---	---
Oak Ridge, Tenn.	164	94	240	104	294	103	411	102	601	105	545	101	572	115	487	105	434	106	348	114	216	106	190	117	375	106
Oklahoma City, Okla.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ottawa, Ontario	144	100	227	95	333	99	367	104	588	103	511	95	565	103	456	99	372	110	---	---	149	112	119	100	---	---
Pearl Harbor, T.H.	411	100	430	99	439	98	578	107	639	109	613	106	637	104	632	110	542	99	479	101	432	110	332	93	514	104
Phoenix, Ariz.	344	99	---	---	---	---	592	98	691	100	758	103	690	104	595	94	593	106	465	100	344	98	257	88	---	---
Portland, Maine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Put-in-Bay, Ohio	146	106	---	---	324	105	398	100	564	120	564	99	593	109	556	112	419	111	316	114	163	108	121	112	---	---
Raleigh, N. C.	237	---	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rapid City, S. Dak.	183	99	266	95	443	103	---	---	---	---	560	89	574	90	544	97	400	97	271	94	---	---	137	---	---	---
Resolute Bay, NWT Canada	0	---	14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0	---	---	---
Riverside, Calif.	232	88	---	---	467	114	429	87	616	113	606	101	589	99	603	111	516	111	427	119	312	113	234	110	---	---
Saint Cloud, Minn.	189	111	205	86	370	93	371	79	539	96	476	85	573	100	---	---	---	---	---	---	---	---	---	---	---	---
Salt Lake City, Utah	168	108	250	102	356	92	469	92	557	102	595	100	609	98	511	84	480	109	273	98	208	116	143	119	385	98
San Antonio, Tex.	---	---	---	---	---	---	---	---	---	---	606	---	650	---	655	---	503	---	430	---	323	---	272	---	---	---
Santa Maria, Calif.	297	102	386	103	530	104	463	76	673	99	628	97	666	101	604	94	513	97	461	107	322	107	230	98	481	98
Sault Ste. Marie, Mich.	134	---	---	---	308	---	402	---	561	---	542	99	553	104	407	90	352	113	173	---	131	---	94	95	---	---
Sayville, N. Y.	148	86	244	100	321	96	462	105	541	101	496	89	512	104	473	103	399	114	270	93	185	99	152	113	350	100
Schenectady, N. Y.	---	---	179	---	235	---	360	---	474	---	455	---	484	---	406	---	325	---	232	---	144	---	114	---	---	---
Seabrook, N. J.	164	88	269	109	341	95	460	102	515	100	531	98	537	108	492	103	407	112	284	100	191	91	150	103	362	101
Seattle, Wash. (Univ. of W.)	85	137	157	176	253	90	467	95	483	95	579	94	567	96	436	92	332	98	179	105	82	93	65	105	307	98
Seattle, Wash. (WBAS)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	478	82	341	79	204	82	---	---	70	92	---	---
Spokane, Wash.	140	117	224	113	351	104	540	94	543	112	619	101	673	100	549	94	411	96	206	82	135	101	---	---	---	---
State College, Pa.	131	96	201	116	264	96	372	96	464	109	506	101	532	104	498	109	380	106	358	104	146	89	122	106	323	103
Stillwater, Okla.	243	97	270	99	392	95	481	99	510	102	544	91	639	125	513	98	483	114	301	89	229	94	195	93	400	101
Swan Island, W.I.	---	---	---	---	---	---	---	---	647	---	536	---	607	---	602	---	549	---	541	---	393	---	442	---	---	---
Tampa, Fla.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thule, Greenland	---	---	6	---	111	---	343	---	572	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Toronto, Ontario	118	124	154	94	237	87	301	84	510	113	445	85	492	103	435	99	349	113	195	90	139	129	79	84	288	99
Upton, N. Y.	136	88	220	103	306	96	455	108	536	97	505	90	547	113	494	108	420	117	280	93	200	115	134	102	353	103
Wake Island, Pacific Area	416	---	549	---	581	---	620	---	590	---	635	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Washington, D.C. (Amer. U.)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Washington, D.C. (WBCO)	173	---	257	---	325	---	429	---	503	---	532	---	564	---	507	---	413	---	288	---	204	94	158	102	363	---
Winnipeg, Manitoba	147	104	189	94	360	108	420	106	598	113	522	94	584	105	424	87	304	96	197	86	144	127	90	91	332	101

Note Langley is the unit used to denote one gram calorie per square centimeter.

SOLAR RADIATION DATA

Table 33. * Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys. YEAR 1951

	Columbia, Mo.	Columbus, Ohio	Keflavik, Iceland	Lexington, Ky.	Sault Ste. Marie, Mich.	Wake Is., Pac.Area
Jan. 1, 1951	102	---	6	265	21	218
2	35	---	4	67	42	421
3	46	---	6	35	91	318
4	49	---	5	274	162	240
5	246	---	5	307	109	231
6	65	53	7	175	174	407
7	280	162	6	84	210	416
Averages-----	118	---	6	172	115	372
Departures---	---	---	--	---	---	---
Jan. 8, 1951	269	203	5	(323)	136	424
9	229	237	6	357	57	426
10	121	87	3	98	115	188
11	250	59	3	203	100	439
12	154	147	8	208	164	460
13	74	66	9	72	166	492
14	91	20	8	33	54	406
Averages-----	170	117	6	(185)	113	405
Departures---	---	---	--	---	---	---
Jan. 15, 1951	117	48	10	68	110	492
16	268	132	5	248	89	482
17	205	210	13	296	208	445
18	287	210	17	182	169	511
19	283	157	11	219	155	398
20	33	72	9	(146)	75	485
21	296	103	6	119	213	515
Averages-----	213	133	10	(183)	145	499
Departures---	---	---	--	---	---	---
Jan. 22, 1951	201	155	19	277	111	540
23	228	34	--	37	52	535
24	283	256	--	351	199	500
25	273	175	--	123	207	526
26	292	285	--	314	190	329
27	185	229	--	51	183	328
28	110	17	--	23	180	381
Averages-----	224	165	--	168	160	448
Departures---	---	---	--	---	---	---
Averages-----						
Departures---						

		Bethel, Alaska	Columbia, Mo.	Columbus, Ohio	Fort Worth, Tex.	Greensboro, N.C.	† Inyokern, Calif.	Keflavik, Iceland	Lexington, Ky.	Resolute Bay, N.W.T. Canada	Sault Ste. Marie, Mich.	Thule, Greenland	Wake Is., Pac.Area
Jan.	29	29	299	77	68	---	227	6	31	0	209	---	457
	30	68	170	210	133	---	330	16	147	0	275	---	396
	31	46	64	41	147	---	396	15	31	0	216	---	482
Feb.	1	39	362	98	485	---	409	19	117	1	188	---	496
	2	43	384	308	480	---	397	27	369	1	276	---	487
	3	90	288	278	437	---	405	38	329	2	180	---	523
	4	49	338	180	(403)	---	335	38	137	1	143	---	514
		52	272	106	(308)	---	357	(23)	166	1	211	---	479
		-4	---	---	---	---	---	--	---	-	---	---	---
Feb.	5	44	223	99	257	---	403	29	203	1	---	---	512
	6	77	53	111	435	---	399	36	145	3	---	---	568
	7	87	389	339	457	---	369	39	304	2	---	---	574
	8	78	213	324	413	---	238	56	314	3	---	---	534
	9	46	286	301	461	198	421	44	234	4	---	---	557
	10	50	272	262	438	398	378	57	379	6	---	---	475
	11	61	349	227	444	454	376	28	176	6	---	---	376
		63	255	239	415	---	369	41	251	4	---	---	514
		-5	---	---	---	---	---	--	---	-	---	---	---
Feb.	12	69	106	43	457	445	363	40	192	8	---	---	436
	13	79	26	49	44	382	439	64	110	11	---	---	597
	14	54	123	94	139	374	329	51	68	7	---	---	613
	15	97	38	132	400	111	462	76	175	9	---	---	596
	16	97	101	51	525	40	453	88	88	8	---	---	584
	17	99	399	51	364	307	469	48	428	14	---	3	606
	18	162	63	271	479	368	483	58	198	23	---	4	608
		94	122	99	344	287	428	61	180	11	---	---	577
		+3	---	---	---	---	---	--	---	--	---	---	---
Feb.	19	137	(142)	205	186	183	493	86	331	20	---	5	576
	20	86	30	75	415	223	492	81	143	12	---	6	642
	21	86	155	53	283	179	508	45	50	23	---	4	(599)
	22	83	125	214	444	444	510	25	313	24	---	4	476
	23	183	149	347	69	457	399	52	461	43	---	9	595
	24	82	280	259	259	466	438	73	451	25	---	11	593
	25	121	109	272	147	401	528	105	353	25	---	18	607
		111	(141)	204	258	336	481	67	300	25	---	8	(584)
		-7	---	---	---	---	---	---	---	--	---	-6	---

		Columbia, Mo.	Lexington, Ky.	Resolute Bay, N.W.T. Canada	Sault Ste. Marie, Mich.	Thule, Greenland
Feb.	26	424	138	42	26	26
	27	375	495	49	136	28
	28	134	84	32	377	(31)
Mar.	1	412	512	44	114	18
	2	97	110	--	268	(25)
	3	366	102	--	41	40
	4	459	147	--	383	47
		324	227	41	192	(31)
		---	---	--	---	0
Mar.	5	439	503	--	374	49
	6	331	205	--	143	72
	7	308	340	--	329	(57)
	8	397	478	--	304	42
	9	377	492	--	461	48
	10	30	249	--	493	(45)
	11	31	124	--	397	69
		273	341	--	357	(54)
		---	---	--	---	-7
Mar.	12	103	57	--	342	88
	13	136	166	--	418	83
	14	103	160	--	(401)	100
	15	355	97	--	183	94
	16	507	479	--	415	114
	17	83	170	--	496	120
	18	333	145	--	238	127
		231	182	--	(356)	104
		---	---	--	---	+2
Mar.	19	486	124	--	348	136
	20	383	631	--	301	148
	21	586	328	--	457	139
	22	524	611	--	266	147
	23	354	350	--	352	119
	24	569	307	--	---	143
	25	559	352	--	542	181
		495	386	--	378	145
		---	---	--	---	-6
Mar.	26	491	595	--	533	150
	27	162	292	--	335	141
	28	256	144	--	59	231
	29	60	384	--	67	224
	30	234	125	--	46	(208)
	31	(478)	554	--	145	(225)
Apr.	1	175	129	--	138	288
		(265)	318	--	189	(209)
		---	---	--	---	+5

		Columbia, Mo.	Lexington, Ky.	Ottawa, Ontario	Sault Ste. Marie, Mich.	Thule, Greenland
Apr.	2	141	215	---	328	265
	3	613	173	---	354	286
	4	592	317	---	378	294
	5	157	649	---	601	268
	6	179	219	---	534	293
	7	(239)	140	---	469	230
	8	290	485	---	415	180
		(316)	314	---	440	260
		---	---	---	---	0
Apr.	9	365	378	---	471	348
	10	196	493	---	349	321
	11	147	116	---	304	170
	12	91	332	---	65	359
	13	(192)	197	---	419	250
	14	(526)	656	---	235	348
	15	472	540	---	234	389
		(284)	387	---	297	312
		---	---	---	---	---
Apr.	16	654	295	---	218	394
	17	665	617	---	455	398
	18	247	724	---	181	412
	19	679	487	---	640	426
	20	515	728	---	467	430
	21	200	533	---	157	412
	22	652	138	---	79	355
		516	503	---	314	404
		---	---	---	---	---
Apr.	23	706	745	---	595	314
	24	370	702	417	577	424
	25	443	626	244	204	207
	26	497	252	616	683	403
	27	517	604	730	582	378
	28	610	700	308	541	492
	29	612	577	525	663	412
		537	601	465	549	376
		---	---	+12	---	---

Note:--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* Data not available for publication in monthly issues.
† This is a correction of Inyokern data for February 1951.

SOLAR RADIATION DATA

Table 33.* Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys —Continued

	Aklavik, MacKenzie	Amherst, Mass.	Barrow, Alaska	Columbia, Mo.	Edmonton, Alberta	Lexington, Ky.	Ottawa, Ontario	Sault Ste. Marie, Mich.	Winnipeg, Manitoba
Apr. 30, 1951	451	728	382	657	---	652	---	723	306
May 1	401	705	406	367	---	718	---	661	435
2	654	623	460	690	---	589	---	454	600
3	453	646	575	641	---	709	---	339	565
4	460	669	430	512	---	654	---	664	579
5	584	714	568	693	---	(635)	---	327	687
6	619	508	579	232	---	195	---	677	698
Averages-----	517	649	486	542	---	(593)	---	549	553
Departures---	+34	+198	---	---	---	---	---	---	+97
May 7, 1951	550	384	419	737	---	641	---	730	703
8	333	428	358	714	---	775	---	719	635
9	223	526	393	296	---	755	---	732	739
10	545	712	395	157	---	467	---	700	731
11	367	63	529	587	---	107	---	697	456
12	402	236	450	745	---	763	---	764	720
13	440	760	527	701	---	748	---	720	368
Averages-----	409	436	439	562	---	608	---	723	622
Departures---	-87	-74	---	---	---	---	---	---	+113
May 14, 1951	451	708	573	674	449	782	---	---	599
15	644	679	544	674	577	763	---	224	519
16	485	608	513	579	405	765	---	317	611
17	394	585	585	652	374	732	---	738	721
18	573	587	607	554	267	586	---	366	242
19	693	710	499	486	471	606	---	697	677
20	710	391	539	643	---	707	---	487	574
Averages-----	564	617	551	609	424	706	---	471	563
Departures---	+60	+141	---	---	-51	---	---	---	+14
May 21, 1951	496	449	546	289	595	628	631	(673)	537
22	545	635	487	158	541	---	710	363	722
23	204	209	633	739	494	---	433	672	594
24	575	200	636	761	717	---	806	(661)	568
25	356	131	619	570	548	---	735	620	531
26	409	125	598	757	604	---	750	648	656
27	509	29	684	768	227	---	79	349	790
Averages-----	442	252	601	577	532	---	592	(569)	628
Departures---	-78	-136	---	---	+33	---	+42	---	+61
May 28, 1951	765	111	639	725	152	---	437	139	493
29	662	69	814	520	313	---	393	678	739
30	754	95	845	687	444	---	615	753	534
31	754	120	628	595	514	---	638	247	522
June 1	754	698	607	656	643	---	558	170	544
2	754	200	630	554	427	---	569	229	176
3	715	151	428	190	301	---	427	125	607
Averages-----	736	214	656	561	399	---	520	334	516
Departures---	+229	-183	---	---	-109	---	+14	---	-31

		Amherst, Mass.	Barrow, Alaska	Columbia, Mo.
June	4	314	593	666
	5	497	385	459
	6	697	535	356
	7	782	476	434
	8	702	381	619
	9	663	594	(562)
	10	488	494	(659)
		592	494	(536)
		+88	---	---
June	11	372	494	482
	12	711	527	394
	13	459	588	721
	14	73	729	368
	15	158	666	373
	16	366	730	463
	17	426	622	586
		403	623	484
		-131	---	---
June	18	586	690	505
	19	596	684	571
	20	594	354	708
	21	427	375	465
	22	617	268	191
	23	173	482	130
	24	710	266	574
		517	446	449
		+7	---	---
June	25	682	563	506
	26	712	778	328
	27	316	827	469
	28	469	537	131
	29	125	784	304
	30	200	783	432
July	1	275	552	644
		397	689	402
		-112	---	---

		Aklavik, MacKenzie	Amherst, Mass.	Edmonton, Alberta	Ottawa, Ontario	Sault Ste. Marie, Mich.
July	2	630	703	---	---	612
	3	671	753	---	---	393
	4	509	518	---	---	130
	5	198	478	---	---	799
	6	175	339	---	---	798
	7	428	671	---	---	358
	8	292	512	---	---	465
		415	553	---	---	508
		-86	---	---	---	-35
July	9	455	---	---	---	617
	10	249	---	---	---	604
	11	531	---	---	---	580
	12	400	---	---	---	703
	13	301	---	---	---	703
	14	634	---	---	---	734
	15	702	---	---	---	385
		467	---	---	---	618
		-9	---	---	---	+75
July	16	671	---	430	340	367
	17	440	---	538	677	622
	18	336	---	330	738	240
	19	212	---	604	603	573
	20	478	---	638	639	765
	21	572	---	627	395	125
	22	253	---	665	705	774
		423	---	547	485	495
		-28	---	+75	-63	-48
July	23	405	---	581	782	730
	24	485	---	642	735	648
	25	486	---	445	695	(434)
	26	598	---	541	685	687
	27	---	---	499	549	563
	28	---	---	516	679	711
	29	375	---	566	723	535
		470	---	541	693	(616)
		+64	---	+74	+152	+95

		Edmonton, Alberta	Fairbanks, Alaska	Ottawa, Ontario
July	30	519	385	553
	31	574	574	306
Aug.	1	650	565	711
	2	531	491	576
	3	626	269	346
	4	605	556	670
	5	298	286	760
		543	447	560
		+83	+94	+33
Aug.	6	360	582	726
	7	347	212	260
	8	246	287	91
	9	413	531	464
	10	344	406	725
	11	500	317	558
	12	525	537	431
		390	439	465
		-34	+102	-25
Aug.	13	---	507	---
	14	---	441	---
	15	---	293	---
	16	---	244	---
	17	---	390	---
	18	---	453	---
	19	---	365	---
		---	383	---
		---	+54	---
Aug.	20	---	384	---
	21	---	359	---
	22	---	---	---
	23	---	---	---
	24	---	---	---
	25	---	---	---
	26	---	---	---
		---	---	---
		---	---	---
Aug.	27	---	---	---
	28	---	---	---
	29	---	---	---
	30	---	---	---
	31	---	---	---
Sept	1	---	---	---
	2	---	---	---
		---	---	---
		---	---	---

		Aklavik, MacKenzie	Davis, Calif.	Fairbanks, Alaska	Winnipeg, Manitoba
Sept	3	77	618	---	---
	4	148	621	---	---
	5	142	612	---	---
	6	360	596	---	---
	7	137	598	---	---
	8	201	600	230	---
	9	77	590	62	---
		163	605	---	---
		-39	+72	---	---
Sept	10	86	577	343	---
	11	176	576	97	---
	12	90	573	358	---
	13	288	550	150	---
	14	206	555	93	---
	15	126	535	(222)	---
	16	76	254	101	---
		150	517	195	---
		-11	+25	-2	---
Sept	17	37	500	255	---
	18	105	424	94	---
	19	55	522	199	---
	20	96	532	241	---
	21	91	539	251	---
	22	91	530	78	---
	23	86	524	219	---
		80	510	191	---
		-45	+26	+20	---
Sept	24	146	509	224	276
	25	70	535	234	198
	26	91	521	170	48
	27	84	516	125	233
	28	119	501	152	237
	29	127	440	102	262
	30	83	436	167	346
		103	494	168	229
		-5	+25	+33	-64

Note:--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* Data not available for publication in monthly issues.

SOLAR RADIATION DATA

Table 33. * Daily totals and average daily totals by weeks of solar radiation (direct and diffuse) received on a horizontal surface, tabulated in langleys.—Continued

	Aklavik, MacKenzie	Davis, Calif.	Edmonton, Alberta	Winnipeg, Manitoba					Keflavik, Iceland	Winnipeg, Manitoba					Columbia, Mo.
Oct. 1, 1951	172	196	---	---			Oct.	29	34	---			Dec.	3	242
2	186	377	---	---				30	91	---				4	243
3	156	503	---	---				31	18	---				5	85
4	164	518	---	---			Nov.	1	29	---				6	249
5	85	506	---	---				2	39	---				7	286
6	93	491	---	---				3	11	---				8	49
7	66	491	---	---				4	40	---				9	78
Averages-----	132	440	---	---					37	---					176
Departures---	+33	+30	---	---					-3	---					-13
Oct. 8, 1951	63	470	290	---			Nov.	5	52	---			Dec.	10	303
9	68	465	239	---				6	71	---				11	209
10	66	310	258	---				7	58	---				12	87
11	47	467	184	---				8	45	---				13	143
12	76	466	166	---				9	9	---				14	69
13	48	456	131	---				10	57	---				15	308
14	101	442	138	---				11	(34)	---				16	189
Averages-----	67	439	201	---					46	---					187
Departures---	-16	+61	+17	---					+10	---					+7
Oct. 15, 1951	48	329	114	---			Nov.	12	11	---			Dec.	17	30
16	61	327	72	---				13	21	---				18	252
17	141	319	112	---				14	12	---				19	78
18	149	291	120	---				15	31	---				20	30
19	39	398	149	---				16	21	---				21	299
20	37	413	99	---				17	10	---				22	170
21	33	401	185	---				18	5	---				23	246
Averages-----	73	354	122	---					16	---					158
Departures---	-3	-1	-29	---					-13	---					-24
Oct. 22, 1951	103	389	196	242			Nov.	19	40	---			Dec.	24	123
23	121	230	134	268				20	41	---				25	78
24	83	79	116	151				21	25	---				26	165
25	46	376	253	55				22	25	---				27	293
26	23	377	184	191				23	14	---				28	257
27	19	378	83	95				24	49	---				29	227
28	29	349	74	108				25	16	---				30	69
														31	165
Averages-----	58	311	149	159					30	---					173
Departures---	-4	-1	+19	-3					+4	---					+5
							Nov.	26	19	77					
								27	25	103					
								28	29	125					
								29	27	129					
								30	64	80					
							Dec.	1	94	126					
								2	45	27					
Averages-----									43	95					
Departures---									+22	-15					

Note:--Langley is the unit used to denote one gram calorie per square centimeter.
Values in parentheses are interpolated.

* Data not available for publication in monthly issues.

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Chart I. Departure from Normal of Annual Average Temperature (°F.) at Surface, 1951.

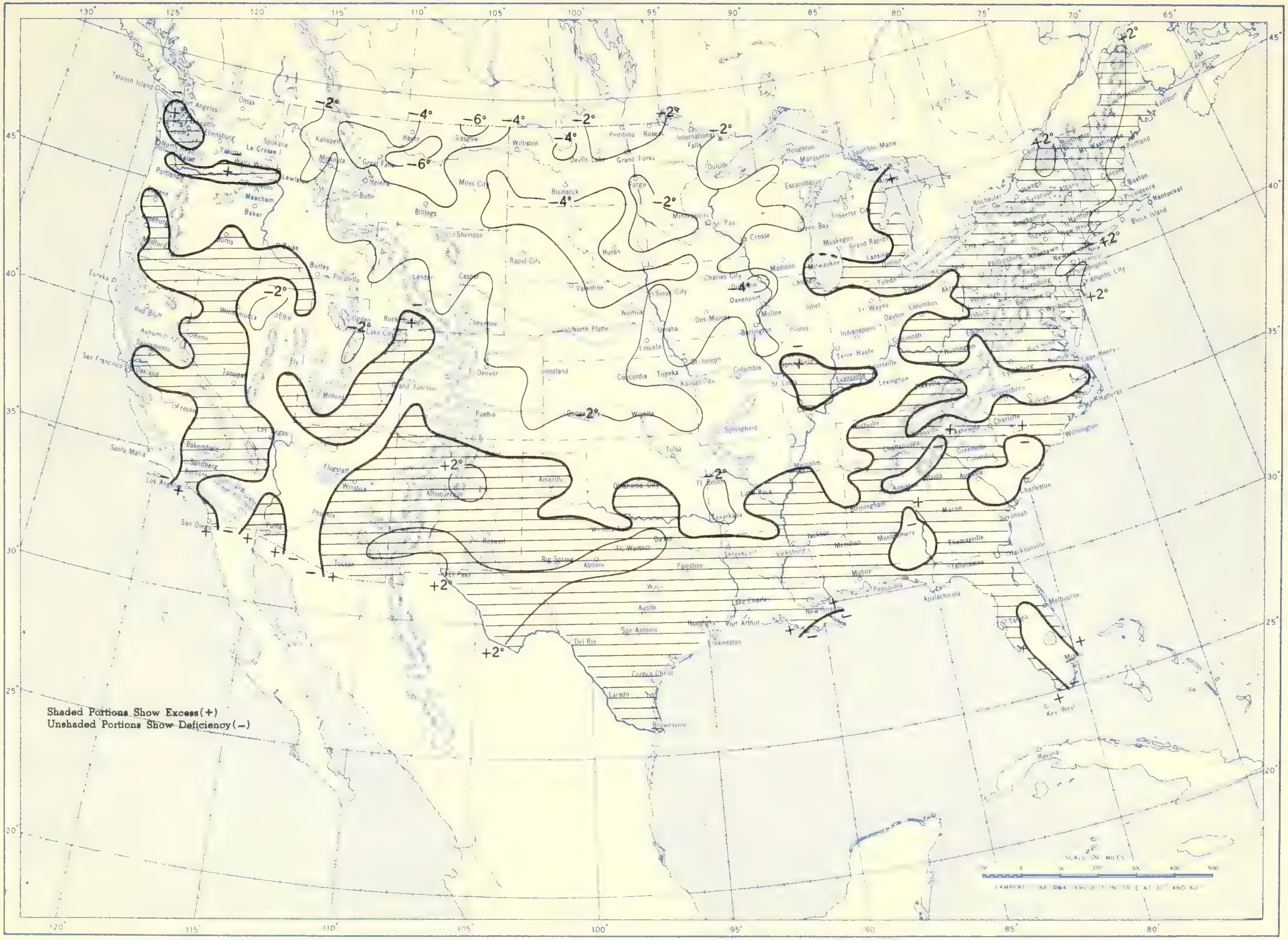
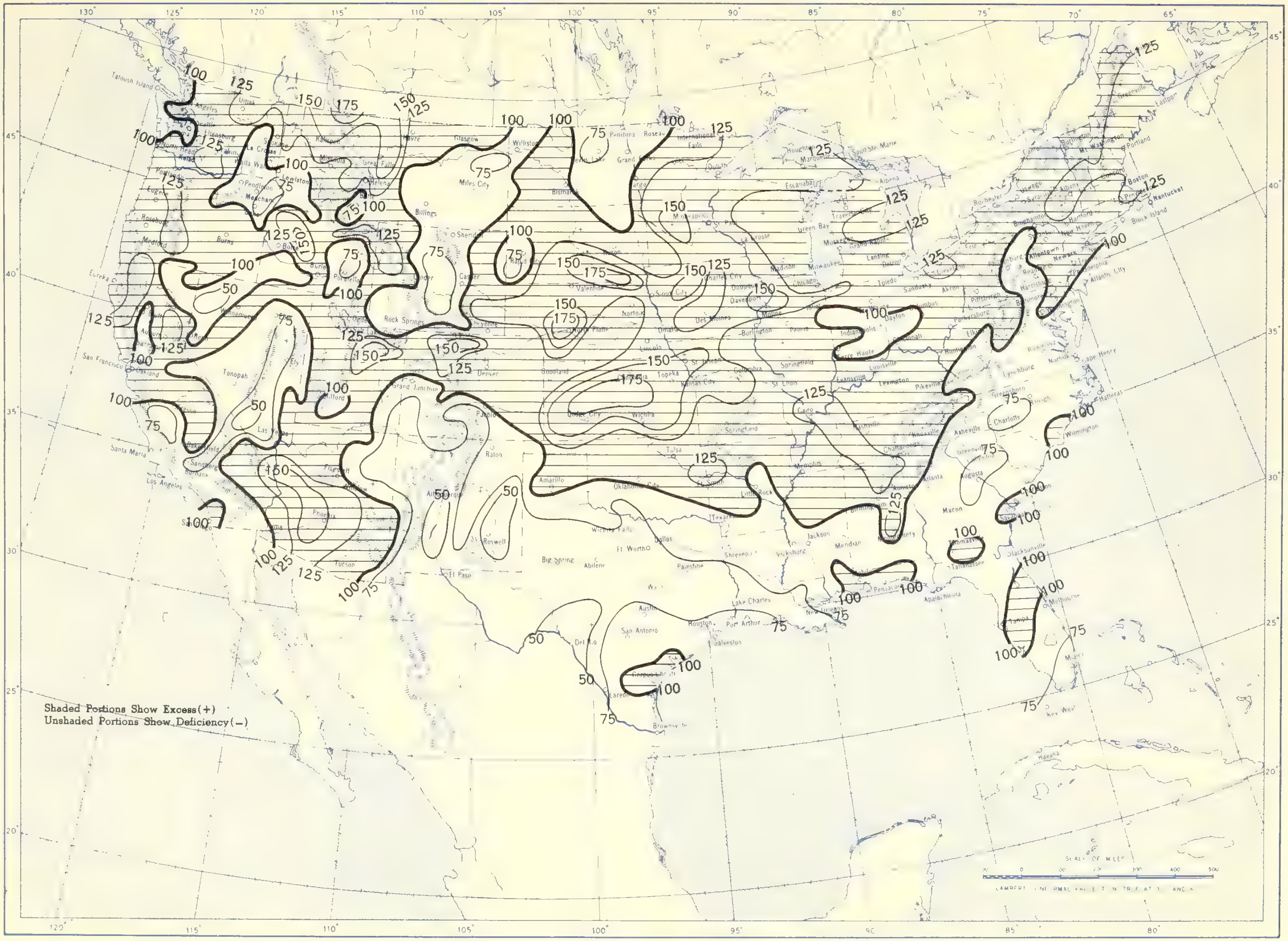

Shaded Portions Show Excess (+)
Unshaded Portions Show Deficiency (−)
−2°
−4°
−6°
+2°
SCALE OF MILES
0
100
200
300
400
500
LAMBERT CONFORMAL PROJECTION TRUE AT 30° AND 60°

Chart II. Percentage of Normal Annual Precipitation, 1951.



Shaded Portions Show Excess(+)
Unshaded Portions Show Deficiency(−)
Scale of Miles

Chart III. Tracks of Tornadoes, 1951.

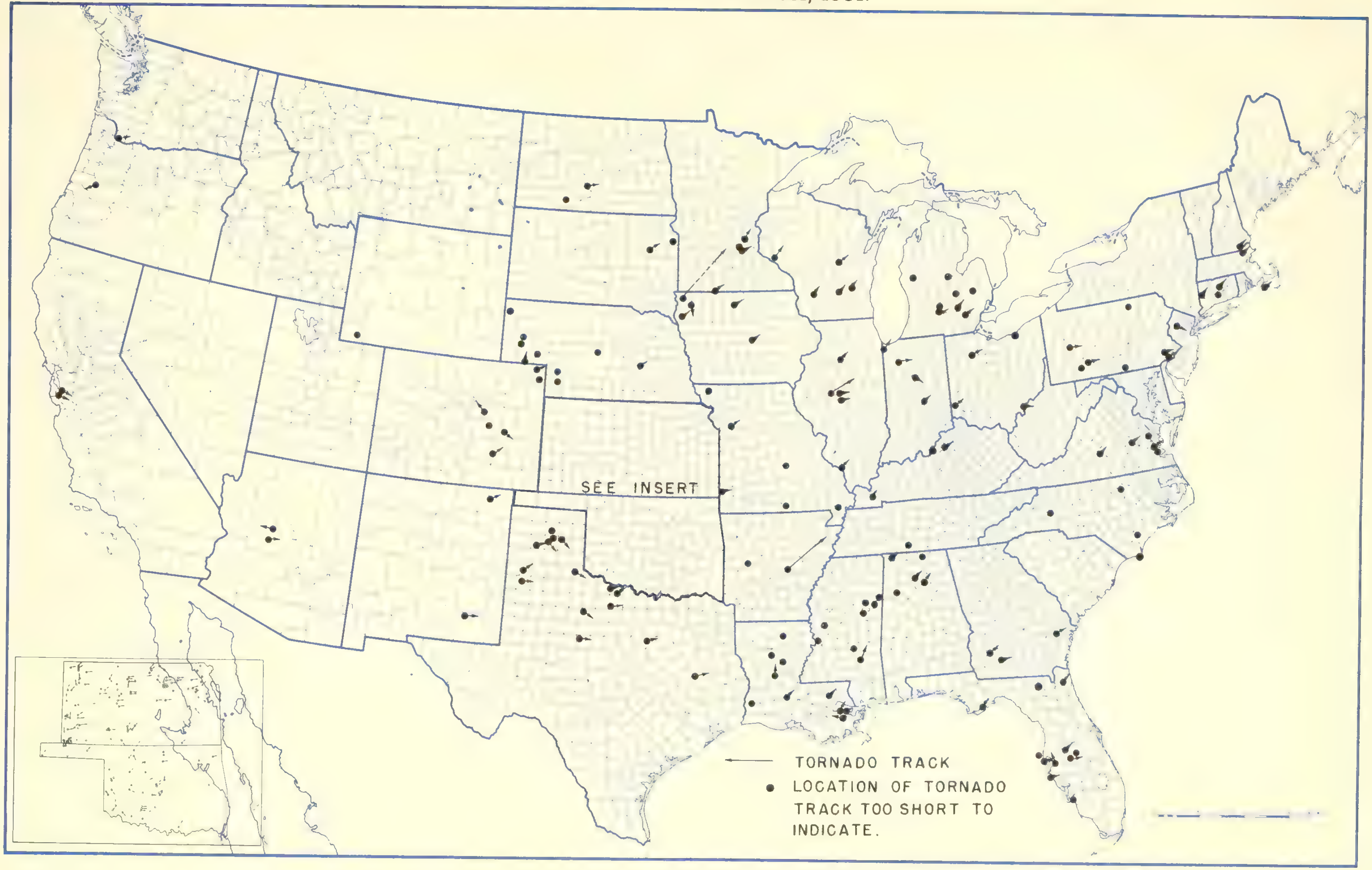
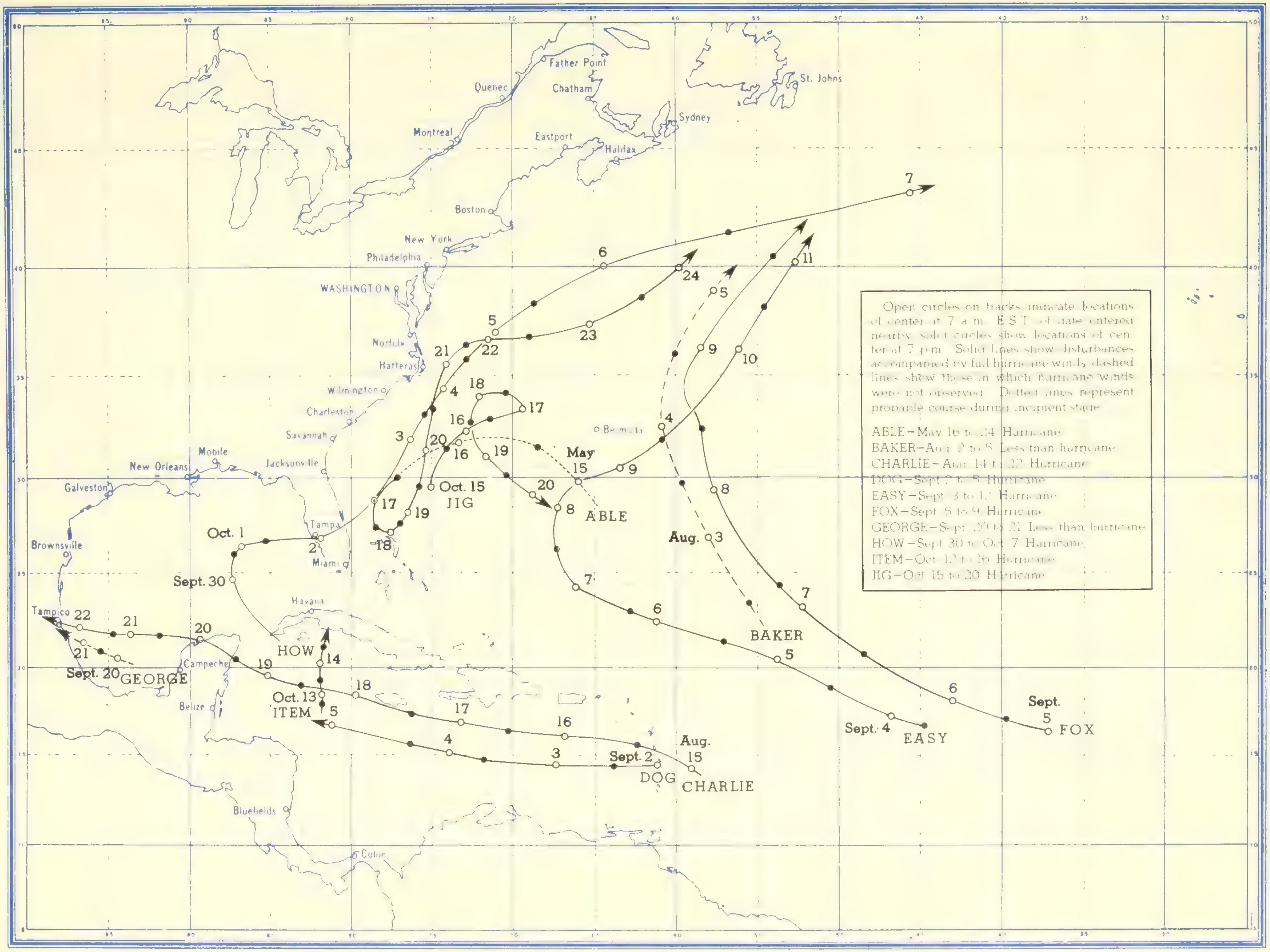


Chart IV. Tracks of North Atlantic Hurricanes and Tropical Disturbances, 1951.



Open circles on tracks indicate locations of center at 7 a.m. E.S.T. of date entered nearby; solid circles show locations of center at 7 p.m. Solid lines show disturbances accompanied by full hurricane winds; dashed lines show those in which hurricane winds were not observed. Dotted lines represent probable course during incipient stage.

ABLE—May 16 to 24 Hurricane
BAKER—Aug 2 to 5 Less than hurricane
CHARLIE—Aug 14 to 22 Hurricane
DOG—Sept 2 to 5 Hurricane
EASY—Sept 3 to 12 Hurricane
FOX—Sept 5 to 9 Hurricane
GEORGE—Sept 20 to 21 Less than hurricane
HOW—Sept 30 to Oct 7 Hurricane
ITEM—Oct 12 to 16 Hurricane
JIG—Oct 15 to 20 Hurricane

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